College and University Business

DECEMBER 1947: Faculty Houses ★ Denominational College Operation ★ Facts on FM ★ Simplifying Kitchen Work ★ Outdoor Heating Controls ★ Sampling Technics

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Among the Authors

E. G. SULZER

ELMER G. SULZER, director of radio at the University of Kentucky and head of the department of radio arts, has been prominent in college public relations work. He has been a member of the university staff since 1926 and is serving this year as vice president of the American College Public Relations Association with special responsibilities for its radio work. He has authored a book on 25 Kentucky folk ballads and has written on FM and television for several magazines. A railroad fan, he has done extensive research regarding Kentucky's abandoned railroad lines.

E. U. CONDON

DR. EDWARD U. CONDON, director of the National Bureau of Standards, is a well known physicist who has an outstanding record in federal government service. He was appointed by President Truman to the National Advisory Committee for Aeronautics, is chairman of the Federal Specifications Board and president of the National Conference of Weights and Measures. He wrote the basic manual on atomic energy for the use of scientists who began work on the atomic bomb at Los Alamos. Most of his 60 research papers are "required reading" in nuclear physics. He was at one time associate director of the Westinghouse Research Laboratories. Among his friends he is renowned for his complete avoidance of athletic contests.

L. V. PHELPS

LOUIS V. PHELPS, secretary-treasurer of Grinnell College, is an engineer who has gone into business administration of a liberal arts college. His background made it possible to plan and execute all details involved in the construction of new homes for the faculty. Other buildings on the Grinnell campus have been designed by this versatile business manager-designer. . . . J. HARVEY CAIN, accounting officer of the board of higher education of the City of New York, was formerly director of the financial advisory service of the American Council on Education. Prior to that affiliation, he was business manager of the Catholic University of America in Washington, D. C.

G. F. BAUGHMAN

GEORGE F. BAUGHMAN, assistant business manager of the University of Florida, has occupied his present position since his release from the navy as lieutenant commander in 1945. Previous to the war he had been a banker, lawyer and professor of business administration. In his present position he has been responsible, among other duties, for having to provide an approximate 150 per cent increase of campus facilities in less than one year. Author of two books, he collaborated with Edward R. Stettinius in writing "Lend Lease, Weapon of Victory" in 1944. He enjoys travel, having visited 64 countries; for additional hobbies he lists "model railroading, gardening, blondes, pastel colors and southern atmosphere."

Looking Forward

The P.A. Pays His Way

HOW MANY COLLEGE ADMINISTRATORS REALIZE that the services of a good purchasing agent cost them nothing? In the course of a year, intelligent buying by the college purchasing officer can save the institution thousands of dollars in excess of his own salary.

Considerable responsibility and authority should be placed on the shoulders of the person responsible for college purchasing. He or she should be authorized to make purchases without departmental or administrative interference. This, of course, assumes the condition that all purchasing will be on the basis of quality and price and in a manner consistent with the policies of the institution. More effective buying can be done and greater savings to the institution realized when the purchasing agent can conduct a centralized purchasing agency free from petty interventions.

A competent purchasing executive knows his commodities, the available markets and the proper method of handling vendors. Since through such centralized purchasing technics it is possible more effectively to control costs and budgets, the administration should bend every effort to make certain that the most competent person possible is given responsibility for college purchasing.

Meatless Tuesdays

COLLEGES AND UNIVERSITIES, BEING LARGELY consumers of food products, can make a really significant contribution to the President's food program.

In addition to careful menu planning during the next few months, there are many conservation adjustments that will reduce the consumption of meat or grain products. Food service directors can use more fruit—cooked or raw—for desserts rather than flour-consuming cakes and pastry; they can serve fish frequently, definitely a desirable food in view of its high protein content. Salads can be featured more prominently. Nor should the one crust pie be overlooked. In pie eating America a single item like an open-faced pie accumulates into a substantial saving in flour consumption.

The first objective of the Citizens Food Committee, to obtain an extra 100,000,000 bushels of wheat for distribution to needed areas of Europe, has been achieved. Actual direction of the food program has now been turned over to the Cabinet Food Committee and the voluntary food saving program will be continued at least for the first six months of next year. One of the best ways of conserving wheat is by cutting down on the feeding of wheat to livestock and poultry; hence, meatless Tuesdays and eggless Thursdays. As stated by the Citizens Food Committee: "What happens in Europe in the next six months is of immediate decisive concern to all Americans [and this definitely includes colleges and universities]. Our own self interest demands that we back up with food Europe's attempts at reconstruction. Our failure may lead to political catastrophe endangering our own security and prosperity and the peace for which we are working."

Mightier Than the Pen

IT IS A DISCOURAGING NOTE THAT SOME COLLEGE business offices are conducted in the way Grandfather would have operated them. There is little awareness that times have changed.

Streamlined office procedures are imperative in times of urgency and heavy volume. The old pen and ink method of keeping accounts has a terrific time keeping up with the pace. To keep adding personnel to wield more pens is an expensive way of clearing the obstacle, particularly in these days of inflated salaries and sloppy work habits.

The size of an institution has little relation to the decision as to whether an office should be mechanized. Efficiency is just as important in the small college as in the mammoth university. Alert and astute business officers of small colleges have already realized this and are directing their energies toward improvement of office technics. Business and accounting machines of all types are available to the administrator sincerely interested in making his office a model of efficiency. Not only is the business officer able to complete the work of his office in less time but he is able through his use of machines to conduct studies and surveys of operations not otherwise possible. As a result, he becomes a more constructive influence in the institution's affairs.

COLLEGES, KEEP OUT!

- **Has the public debt any relation to the American college?**
- **Have the colleges any responsibility for explaining to teachers and students what the debt means?**
- **Is there no limit to the demands that may be made upon the federal government to spend money?**

J. HARVEY CAIN
Accounting Officer, Board of Higher Education, City of New York

AS ONE LONE VOICE CRYING IN THE wilderness, I must emphasize that the gravity and enormity of this debt must be brought home to the American people. Unless the nation has the courage, the character and the stamina to face this obligation, any return to a better standard of living will be impossible for most people.

The huge sum comprising this debt was spent to satisfy Mars. It is gone forever, with the exception of a modicum of equipment that will soon become obsolete. Those war bonds we own do not represent investments in homes, automobiles, radios, heating plants and refrigerators. These have yet to be built at inflated prices. War bonds are now I.O.U.'s and represent things that have been destroyed and must be redeemed in taxes.

WHAT THE DEBT MEANS

The average man in the street thinks of the debt as too far away to concern him. "We owe it to ourselves," and similar inept phrases, cannot explain it away. Tremendous salaries paid to young, inexperienced people during the war, and still being paid, have led to a false sense of individual personal prosperity. The war has left a debt the vastness of which cannot be comprehended by an individual.

The Federal Reserve Board *Bulletin* for July 1947 reports the gross public debt at more than $258,000,000,000. The annual interest rate is slightly more than 2 per cent. At this rate it requires an annual interest payment of well over $5,000,000,000.

From its highest peak of $279,000,000,000 in February 1946 the debt was reduced by $21,000,000,000. This had little effect, however, for President Truman states that the United States has since the war spent nearly $20,000,000,000 in relief and free loans to agencies dependent upon the United States for their survival. Since 1934 the United States government has doled out in loans just slightly less than $110,000,000,000 to foreign and domestic borrowers. Most of the money has never been paid back and much of it never will be repaid. It is estimated that at least another $20,000,000,000 will be required from us for European economic recovery.

If our people are determined to back up the Truman and Marshall policies, they must be prepared to meet the consequent cost, which means more borrowed money and more taxes.

What has all this to do with the colleges? It has a lot to do, because one may read in the papers every day where this branch of government or that just *must* have more billions to carry on its modest program. I feel a bit squeamish when I read of the demands from some quarters for billions of dollars more for higher education.

These importunate demands are based to some extent on fantastic estimates of predicted increases in enrollment. Many of these estimates obviously are not borne out by the salient facts. Until all data are assembled and studied thoroughly, it might be desirable to consider what a billion dollars is.

All colleges and universities in the United States have, since their beginning and up to now, accumulated property of a permanent or quasi-permanent nature with a total valuation of approximately $4,518,000,000.

Just stop to think for a moment what work, thought and sacrifice have gone into the accumulation of all this property. Yet it requires half a billion dollars more than that sum to pay the interest on the public debt for one year. The total amount spent on the war would duplicate the present college and university plants and endowments more than fifty or sixty times.

All the college teachers and employes in the country would have to contribute every cent of their wages for ten years to pay the interest on the debt for one year. They would have to contribute all their earnings for more than four centuries to pay off the principal of the debt. Frequently during the war the Allied fliers destroyed as many as 20,000 homes in a single raid, meaning that the equivalent of the life savings and the homes of all college teachers could be destroyed in a few raids. Somehow these dwellings must be replaced.

ANOTHER PRESSURE GROUP?

These few examples bring home to us the enormity of the public debt and its effect on college life. Their recital should compel us to think carefully, if we think about it at all, as to where all this money is coming from. Uncle Sam's main source of supply, we must realize, is from our pay envelopes.

Shall we join all the pressure groups in running to the feed trough or shall we take our place as true educators in protecting the financial integrity of the nation? The war has not changed the anatomy of the camel or increased the number of straws he can carry on his back. Therefore, let us survey the needs calmly and accurately and be absolutely certain we cannot do the job assigned to us before we demand all these extra billions. Some day an end must come to the upward spiral, and the colleges as leaders might well set the good example.

MANAGEMENT OF A SMALL CHURCH RELATED COLLEGE

A composite portrait of the business officer in 94 denominational schools

RUBEN J. DUMLER Business Manager, St. John's College, Winfield, Kan.

THE BOARD OF CONTROL OF ST. John's College created a new position of business manager on Sept. 1, 1946. Without previous experience in college management, I was employed to take the post. Up to this time, the business of the school had been conducted by the president and faculty members.

The literature on duties and responsibilities of the college business officer is limited, especially in regard to the small church related college. In view of this situation, it was decided that study should be made of actual conditions in the small denominational colleges throughout the United States.

The denominational college plays an important rôle in the vast undertaking of higher education. Gould Wickey, secretary-treasurer of the National Commission on Christian Higher Education of the Association of American Colleges, reports that there are 779 denominational colleges in the United States. The Kansas Educational Directory of 1945-46 lists 27 institutions of higher learning within the state and of these 14, or 67 per cent, are church related colleges.

The importance of sound business management in the denominational college is emphasized by the fact that each of these 779 colleges has to maintain its own plant and equipment; employ and pay teaching and non-teaching personnel; provide lodging and in many instances furnish meals for students; collect all income, and pay and account for all expenditures.

GOOD CROSS SECTION

In this study a questionnaire was prepared and sent to 187 denominational colleges having an enrollment of 2000 or less. At least one was sent to every state of the Union. Ninety-four, or about 50 per cent, were returned answered. The returns came from colleges located in 40 states. Twenty general groups of church denominations were represented. This gives the study a wide coverage geographically and denominationally.

The enrollment of the schools cooperating in this study ranges all the way from 100 to 1550 students. The arithmetical average enrollment per school is 599.

The small denominational college usually furnishes its students both food and lodging. To the question asking whether the school is a boarding school, 91 per cent answered in the affirmative, 5 per cent said "No," and 4 per cent failed to answer.

In the method of serving meals, family style service still seems to predominate. Forty-seven per cent of the schools serve meals family style; 32 per cent, cafeteria style; 13 per cent, in both styles; 8 per cent made no reply to the question. Some schools using both methods serve breakfast cafeteria style and the other two meals family style. Other schools use one system in one building and another in some other building.

The title of business manager is generally used to describe the position of the person in the administration who is in charge of the school's business activities. While this is perhaps the most frequently used title, comptroller, bursar, treasurer and other forms are employed to describe the position.

Eighty-two per cent of the business managers are men; 13 per cent are women, and 5 per cent of respondents failed to identify their sex. All except two of the women business officers are found in schools for girls.

The ages of the business managers covered range from 21 to 87. The median age is 48. Figure 1 shows the distribution of the ages in graph form.

The educational background of those reporting varies considerably; degrees held range from a bachelor's to the highest obtainable. Some respondents indicate that they have had only a business college education. It is significant, however, that 75 per cent hold a college degree. Table 1 shows the distribution of the various degrees held by the business manager.

Some specialization in accounting and business administration is indicated. Of those reporting, 38 have college credits in the field of accounting and 40, in business administration.

The number of years of business experience outside of school management ranges from one to forty-eight. The median is seven years. Almost 20 per cent of those answering this question lacked other business experience, while a little more than 80 per cent had actual business experience before their present position.

Table 1—Degrees Held By Business Officers

Degree Held	Per Cent
No degree	16
Bachelor's degree	45
Master's degree	26
Doctor's degree	4
C.P.A.	1
No reply	8

On the average, the business manager has been in his present position for five years. It is surprising to note that 15 of the 84 answering this ques-

tion are in their first year on the job. Furthermore, half of those reporting have been in their present position for five years or less. This seems to indicate that many of the positions of business manager have been created during the past few years.

In considering a position, salary should be a secondary consideration; yet monetary compensation often influences many decisions. The salary ranges from $1778 to $6600 a year. The arithmetical average annual salary is about $3525. Services of the business managers of the Catholic schools are donated and cannot be considered here. Figure 2 shows the distribution of the salaries reported.

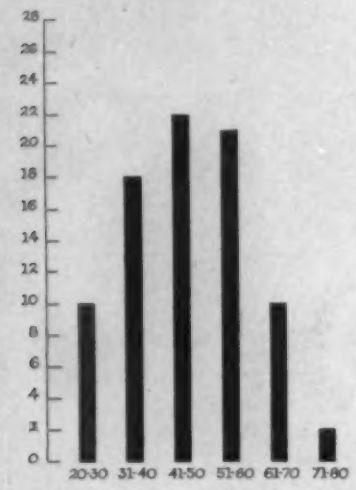


FIG. 1

The distribution of the ages of the business officers into six groups. Vertical figures show number that falls in each age group; horizontal figures represent the age groups.

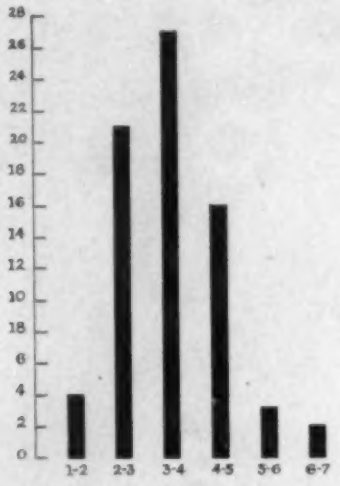


FIG. 2

This shows the distribution of annual salaries. Vertical column indicates number of business officers; horizontal figures represent the salaries in thousands of dollars.

Next in importance to salary of the business manager is vacation with pay. Here again the business officer of the Catholic schools must be excluded, since he or she receives no remuneration. The vacation with pay ranges from fourteen days to ninety days. Thirty-six report that they get an annual vacation of fourteen days; 31 get thirty days off with pay.

In performing his duties, the business manager has at least one full time secretarial employe. Some report as high as six office employes.

Does the business manager also teach classes? In general, the answer is "No." In the small denominational colleges covered by this study, it is somewhat to be expected that the business manager might teach some business subjects. Returns from the study do not bear this out. In other words, 85 per cent of those reporting teach no classes whatsoever, while 15 per cent do some teaching. The subjects most frequently taught by the 15 per cent are accounting and business administration.

Every profession has its own organization for the exchange of ideas and the furtherance of the welfare and advancement of its members. The business manager is no exception. Out of the 78 answering a question on this, only 40 are members. It appears that only about 51 per cent of the business managers of the small denominational college belong to a professional organization. The ones who do belong are members of one or more of 14 associations. I do not know the exact name of some of these associations so the names are given in table 2 just as they were reported on the questionnaire.

Table 3—Body or Person to Whom Business Officer Is Responsible

Person or Body	No. of Schools
President	45
Board of trustees	6
President and board	39

Successful operation of an institution depends upon the adequacy and thoroughness of its organization. In conducting the affairs of a nation, a state, a university or a college it is necessary that each administrative officer know his exact duties and responsibilities in order to avoid duplication of effort and friction.

The type of business organization as revealed by the questionnaire is as follows: 50 per cent of the schools have a unit type of organization; 7 per cent, a multiple type; 43 per cent have a combination of the two. Table 3 shows to whom the business manager is responsible.

One of the main purposes of this study was to determine the duties actually performed by men in the business management field in the small church related college. Literature and fellow business managers were consulted in an effort to draw up an adequate list of duties of the business manager. His duties were

TABLE 2—PROFESSIONAL ORGANIZATION MEMBERSHIPS HELD BY BUSINESS OFFICERS

Association	No. of Members
Educational Buyers Association	17
Central Association of College and University Business Officers	13
Southern Association of College and University Business Officers	7
American Accounting Association	3
Association of Business Officers in Schools for Negroes	3
Eastern Association of College and University Business Officers	1
National Association of Purchasing Agents	1
Catholic Business Education Association	1
Illinois Education Association	1
National Business Managers Educational Institute	1
Western Association of College and University Business Officers	1
Ohio Association of College and University Business Officers	1
Pacific States Business Managers Association	1
Business Administration Association of Minn.	1

TABLE 4—DUTIES PERFORMED BY BUSINESS OFFICERS IN SMALL DENOMINATIONAL COLLEGES

Duties	Yes	No	No Reply
Purchase of all college supplies	79	12	3
Maintenance of college buildings	61	29	4
Collection of tuition and fees	82	9	3
Disbursement of all funds	78	12	4
Accounting records	77	13	4
Purchase of janitorial supplies	67	24	3
Employment of janitors and maintenance men	53	36	5
Signing of vouchers O.K.'ing bills to be paid	79	9	6
Management of bookstore	40	42	12
Management of college union	15	33	46
Purchase of athletic equipment	46	41	7
Ticket sales for athletic events	38	41	15
Purchase of food for cafeteria	30	56	8
Sale of food at cafeteria	27	50	17
Employment of cafeteria staff	41	42	11
Employment of student help	46	39	6
Preparation of annual budget	69	18	7
Operation of student bank	25	15	54

Of a total of 94, the number under the "Yes" column indicates the number of officers who perform this particular function.

incorporated into the questionnaire, and table 4 shows the results. There is no definite uniformity, but it can be concluded that, in general, the business manager is responsible for the conduct of the business office, accounting records, purchase of supplies, collection and distribution of funds and the maintenance of college buildings.

No business administrator can perform his duties efficiently without an adequate accounting system.

A budget is an estimate of future income and expenditures; it is a plan for future action. A properly executed budget will set limits on expenditure for all departments. Out of all the schools reporting, only two state that they do not operate under a budget. This shows the universal use and application of the budget for college accounting.

"Does your accounting system make possible periodic reports to departments on unencumbered balances in their budgets?" To this question, 71 per cent of the answers were in the affirmative; 19 per cent were "No."

Only three of the officers replying do not use the double entry system.

It is surprising to find that 68 per cent of the schools still record all their transactions by hand, while only a little more than 6 per cent have installed a machine bookkeeping system. A combination of the two, however, is used by 20 per cent. Some of the schools report that machines have been ordered but that delivery has not been made.

The voucher system is perhaps the most effective control available to the administrator. Under this system no disbursement of funds is possible without the proper authorization signature on the voucher. Seventy-three per cent of the schools cooperating in this study use the voucher system, while 27 per cent do not.

Another method of strengthening control of expenditure and of providing additional proof of the accuracy of the accounting records is payment of all bills by check. The canceled check automatically provides a receipt and also gives the name of the person who made the payment. Eighty-eight per cent of the schools report that it has been their custom to pay all their bills by check.

Another method used to control the money paid out by checks is to require two signatures on each check. This is an internal check on the one responsible for cash payments. This means of control is used by only 48 of the schools reporting, while 40 use only one signature on checks. A number of the schools report that any two signatures of three or four administrative officers make their checks valid. This weakens control, as there is no single person really responsible for the checks. The individuals usually signing the checks are the treasurer, business manager, vice president or the president.

• Business Manager to President

SHOULD THE POSITION OF COLLEGE business manager be used as a stepping stone to the presidency?

My answer is short but emphatic "No"! The day the business officer sets his cap for the presidency is the day his long range service to the institution begins to be less effective.

The business officer's is as truly a professional position as the executive or administrative dean's—if he makes it that. But his is a facilities, supply and operating personnel problem. Seldom does he have the academic degree considered practically a prerequisite for the presidency, the Ph.D.

One major objective of the business officer, which keeps him on his toes constantly, is an effective and happy relationship with the faculty. When he starts thinking that he himself could or should be a candidate for the presidency, he may start advising on strictly academic matters, and soon will be accused of dictating.

The chief adminstrator should be an educator, one who is himself academically proficient and intellectually capable of winning and maintaining the respect of the faculty; one who has been through the experience of teaching so that he can choose good faculty, recognize good teaching methods and evaluate results. He must be able to analyze the needs of the community being served, to determine the kind of educational program to be given the residents.

The president in his job is dependent upon the business officer and must be a good judge of business recommendations. He must weigh the recommendations of the deans in the light of financial ability of the institution and bring forth sound and practical academic decisions.

The only time that the business officer's position should be used as a stepping stone to the presidency is when a person who has first obtained his academic preparation and experience for the latter position wishes to round this out with practical business management better to equip himself for making the business decisions that will be necessary when he does take on presidential responsibilities.—CHARLES W. HOFF, *finance secretary, University of Omaha.*

Facts on FM

ELMER G. SULZER

Head, Department of Radio Arts, University of Kentucky

Hoisting pole and antenna to top of supporting structure.

NO DOUBT ALL HAVE read of the various efforts of colleges to acquire Frequency Modulation transmitters and set up their own radio stations during the last year or two. Actually, as of July 1947, one or more colleges in the states of Alabama, California, Illinois, Indiana, Iowa, Kentucky, Louisiana, Michigan, New Jersey, New York, Oklahoma, Pennsylvania and Wisconsin either have FM stations under construction or are operating them. Numerous other institutions of higher learning are "considering the matter."

Why should a college have its own Frequency Modulation station? There are three good reasons. An FM station that maintains a high type of programming and truly represents the better phases of its institution certainly builds good public relations for that college. An FM station provides an unexcelled training ground for students in broadcasting. An FM station can provide an educational and cultural service of value to adults and children alike.

These FM benefits indicate that a lot of colleges should own and operate such stations. But now comes into the picture that old boogie that is ever with us: costs! Let's see what they are.

A college going into FM should first consider its potential listening clientele. It is desirable to provide coverage for the city alone in the case of a municipal university. A regional coverage is indicated for a teachers' college. Is the entire state the field of the state university? Is a considerable segment of the country indicated for a large independent university?

Considerations of coverage must precede considerations of the station setup, as power and antenna height may be proportionately reduced as the coverage needs become less. However, from a practical standpoint, in view of the inherent variations with every proposed setup from the standpoint of topography, buildings or other antenna support available, it might be best to plan moderately and to increase station power and antenna height, should it seem necessary, later.

MECHANICAL CONSIDERATIONS

In transmitting high frequencies by coaxial cable, as must be done between transmitter and antenna, the losses in electrical energy are high, which dictates that the transmitter and antenna must be at the same location. Placing the studios at a point other than the transmitter means the employment of extra engineers, the provision of telephone lines from studios to transmitter and the maintenance of two layouts. Therefore, we may conclude that the studios and transmitter ideally should be at the same spot.

If a college has a building on one of the highest parts of the campus in which sufficient room for the studios and transmitter can be provided, it has the ideal situation. This is supposing, of course, that the campus itself is reasonably high as regards the surrounding terrain.

SUPPORTING STRUCTURES

Experience has shown that the waves of FM will bend and, in fact, will go over a number of horizons provided the topography is gently rolling and not rugged. The antenna should be high enough to command a view of at least a mile in every direction when there is rolling topography beyond. The antenna must look over nearby (¼ mile or closer) buildings and other structures except relatively thin objects such as water towers, which can be forgotten unless they are within a hundred yards or so.

To get the antenna up to the proper height the college can use for support a tower erected alongside the building

Left: Engineer and producer in control room B. Right: Master control board, lower band; cabinet at extreme right houses 500 watt FM transmitter.

that will house the studios and transmitter or it can erect a structure on the roof of the building. It should bear in mind, however, that the supporting structure must carry in addition to the antenna the required tower lights, alternating climbers every 18 inches and the coaxial cable from the antenna to transmitter.

The roofs of most modern college buildings will bear the dead weight of a supporting tower up to 50 or 60 feet in height. However, side bracing is a problem on roof towers and, unless some fairly expensive steel fabrication is allowable to tie the tower to the building steel, it would be better to make a roof tower of simple pipe construction.

A 60 foot tower could consist of three lengths of 4, 6 and 8 inch extra heavy steel pipe, guyed in three directions at the 25 foot level. This pipe thickness would amply support the climbers, lights, antenna and coaxial cable. However, there might be a problem in securing the base of such a tower to prevent migration; furthermore electronic messes are caused by the guy wires sometimes.

A better but more expensive plan is to buy a fabricated tower of the tapering type, with a triangular or square cross section. Such a tower should be set on deep concrete piers. The antenna support should still be a steel pipe set in the top of the fabricated tower.

At this point it might be well to discuss various antennas for FM transmitters.

FM ANTENNAS

FM antennas are known as single element or multiple-element antennas. A single element antenna radiates the power produced by the transmitter minus any losses incurred in the transmission line. A multi-element antenna increases the radiating power as additional antenna elements are added, although the proportional increase diminishes as the number of elements is increased.

For instance, in the case of a 1000 watt transmitter, and assuming no loss in the transmission line, a single element antenna will put out 1000 watts, a two element antenna almost 2000 watts, a four element antenna perhaps 2800 watts. Obviously, a multi-element antenna will put out a more powerful signal than will a single element job. Just where the point of diminishing returns on element number lies is a matter of disagreement among manufacturers, engineers and others.

Speaking personally, I would advocate that an institution going into FM for the first time obtain a four element (bay) antenna of the turnstyle type, which is a tried and true development. This can be purchased commercially or fabricated locally by a good radio engineer. Such an antenna will require about 20 feet of pole; this should be borne in mind in planning the antenna tower.

TRANSMISSION LINE

If the power of the transmitter is 1000 watts or less (and I wouldn't advocate higher power for the first effort in FM), the coaxial transmission line should be of ⅞ inch outer diameter. This can be fabricated by the college's electrical maintenance department. Simply obtain some ⅞ inch hard copper refrigerator pipe, ¼ inch copper refrigerator tubing and ¾ inch lava insulators. The coaxial cable can thus be put together as it is erected. It is advisable to eliminate every 90° angle in this line that is possible, so careful planning of the layout of the transmission line in advance is advisable.

When it is necessary that turns take place, short sections of soft-drawn ⅞ inch tubing can be substituted for the hard and it should be bent in as wide an arc as possible, care being taken to increase the number of lava insulators so as to eliminate any chance of the inner tubing touching the outer pipe. The outer pipe, by the way, is at ground potential and may be freely tied in to the building and tower framework without insulation.

TOWER LIGHTS

Before proceeding too far with tower plans, it would be well infor-

mally to check with the nearest office of the Civil Aeronautics Administration and find out just what lighting will be required for the proposed tower. The findings may show that a slight reduction in height may eliminate much expensive lighting equipment, thereby permitting lighter pipe and elimination of climbers to the top.

TRANSMITTER

A half dozen or so manufacturers produce FM transmitters today, so this item may be purchased as a package, roughly $8000 for a thousand watt job and slightly more than half of that for a 500 watt. A 115 volt A.C. availability is adequate for the 500 watt transmitter; the thousand watt transmitters usually require 230 volts, A.C.

STATION ARRANGEMENT

Granted that the transmitter and studios are located in one spot, the next question is "What type of floor plan is required?"

The transmitter and master control equipment should be placed in one room under the supervision of a single engineer. This room should be at least 20 feet square. A studio the same size should adjoin this room, and an announce booth, 5 by 10 feet, should also adjoin it, on a side next to (and not opposite) the studio. This will permit the engineer operating the control unit to look into both the studio and the announce booth without changing position.

The control room, studio and announce booth must have separate corridor entrances; large double or triple glass windows (with the panes set non-parallel) should give visibility from the control room to the other two units. Entrance to the announce booth and studio should be made by small corridors with thick, sound-insulating doors at both ends to constitute an efficient sound lock.

Acoustical treatment can be taken care of by means of conventional foot-square perforated acoustical blocks. These should be applied solidly to the ceilings and to three fourths of the wall space. The uncovered wall space, plus the doors and windows, will give the studios enough "bounce" but there will still be adequate absorption. For the floors, any type of resilient tile or linoleum may be used. Acoustical experts may writhe at the simplicity of the acoustical problem as I have solved it, but it will work well for most small and medium sized units. The control room should also have acoustical treatment applied first to the ceiling and top half of each wall. If that doesn't give enough absorption, additional blocks can be glued on quickly.

STUDIO EQUIPMENT

For speech input equipment and microphones I strongly recommend good standard items. The use of home-made equipment and attempts to adapt public address system amplifiers and microphones are serious mistakes. The desirable equipment to control one studio, one announcer booth, remotes and recordings with approximate prices is as follows:

1 multi-studio console, including line amplifier, monitor amplifier, 7 pre-amplifiers	$1150
3 high quality microphones, stands and cords	320
2 medium quality microphones, stands and cords	100
Plugs and outlet sockets for microphones	25
1 remote outfit	275
2 turntables, dual speed, lateral and vertical, complete	800
1 program rack	100
1 line equalizer	60
2 double jack panels	120
4 loud-speakers	250
Jack cords	30
1 monitor amplifier	100
Total cost of basic speech-input equipment	$3330

The equipment listed will take care of usual needs adequately. Later it may be desirable to add an extra remote outfit, additional microphones, sound effects (filter) panel and recording units.

TOTAL COST

As an indication of what an FM station will cost, and not as a precise guide, the following figures are offered for what they are worth for reasons that should be apparent today to every reader. Every installation has its own peculiar problems that will alter this estimate to a greater or lesser degree.

Transmitter, 250 watt	$5500
Combination frequency and modulation monitor (required by FCC)	850
Speech-input equipment	3330
Antenna and tower (if on top building)	500
Transmission line	100
	$10280

—plus the cost of remodeling for the studio layout.

If, after reading the foregoing, college authorities still have a good taste in their mouths for the proposed FM station, they can write to the Federal Communications Commission, Washington, D. C., for a copy of "Rules Governing Non-Commercial Educational FM Broadcast Stations," and a copy of Form 340 on which to make application for a construction permit.

Too bad it's not a televised broadcast, with this musician performing.

SAMPLING TECHNICS IN PURCHASING

E. U. CONDON
Director, National Bureau of Standards
U. S. Department of Commerce

PURCHASING REQUIRES THE CAREFUL development of precise and detailed specifications of the material desired. This is necessary in order that the purchasing officer may have a clear understanding of the exact requirements of the user and may be fair with suppliers who need to be told exactly what constitutes an acceptable product.

That the purchase specification should include a section dealing with test procedures, the technical means of determining quality, has long been recognized and widely applied.

Equally important as a part of the specification is an exact description of the rules by which samples for test are to be drawn from the offered lot and on the basis of which the lot is to be accepted or rejected as a result of inspection and testing of the individual items in the sample. Therefore, it follows that the purchase specification should either contain specific sampling plans or else refer to a standard set of plans.

HOW MUCH INSPECTION?

Complete inspection to sort the items into accepts and rejects is seldom desirable. It is obviously undesirable when the test is destructive. It is economically undesirable even when the test is nondestructive because the risk of accepting some bad product may be worth taking to save on costs of inspection.

Just how much inspection and testing should be done may depend on other than economic factors. Safety is an especially important one. Obviously, a few bad nails in a barrel of nails will have no serious consequence other than the loss of the money value of the bad ones. But the failure of the safety belts worn by window washers on high buildings has more serious consequences than simply the loss of the money value of one safety belt.

It is evident that inspection and testing of samples cannot give exact information about the whole lot. But this does not mean that we have to content ourselves with fuzzy and vague descriptions of the results of an inspection procedure. The problem can be dealt with by the mathematical theory of probabilities with the same sort of definite results that apply to the life insurance business in spite of the unpredictability of the duration of the life of a particular individual.

WHY A SAMPLING PLAN?

The function of the sampling plan is to lay down rules for the acceptance or rejection of lots of items, just as it is the function of test procedures to lay down rules for deciding on the conformance or nonconformance of individual items.

Every well defined sampling plan can be treated mathematically and characterized by its operating characteristic (OC) curve. This is a curve in which the probability of acceptance of a lot is plotted against the actual fraction of nonconforming items (fraction defective) in the lot.

The simplest approach would be to agree that all lots containing less than, say, 2 per cent defective would be acceptable and those containing 2 per cent or more defective would be rejected (Fig.1). Then we would want a sampling plan that would give us certainty of acceptance if the sample contained less than 2 per cent defective and certainty of rejection if the sample contained more than 2 per cent defective. But this can be accomplished only if we do a complete inspection of the entire lot.

The OC curve for an actual sampling plan always departs from this ideal situation in two ways: (1) it will give some chance of rejection of lots whose fraction defective is less than 2 per cent, or whatever figure was agreed on; (2) it will give some chance of acceptance of lots whose fraction defective is greater than 2 per cent.

The existence of property (1) above represents an unfairness to the supplier in that it occasionally rejects good lots, while that of property (2) represents an unfairness to the user in that it sometimes accepts for him lots that should have been rejected. Both features can be reduced by doing more inspection at consequently greater cost. Our problem is to achieve the most economical and efficient compromise between these limitations of a sampling plan and the desire to minimize inspection costs.

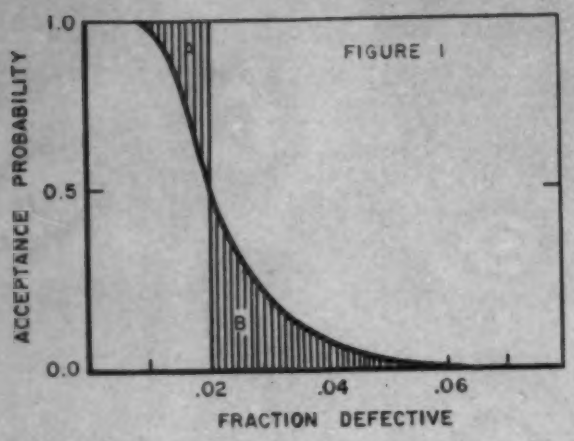
It is surprising how unsatisfactory some sampling plans can be. Consider, for example, an inspection plan in which a sample of two is drawn from a lot of 100 items. The lot is accepted if both items in the sample meet the requirements and is rejected if either one fails. This plan has the operating characteristic curve shown in figure 2 which obviously provides poor protection against acceptance of lots containing large amounts of defective goods.

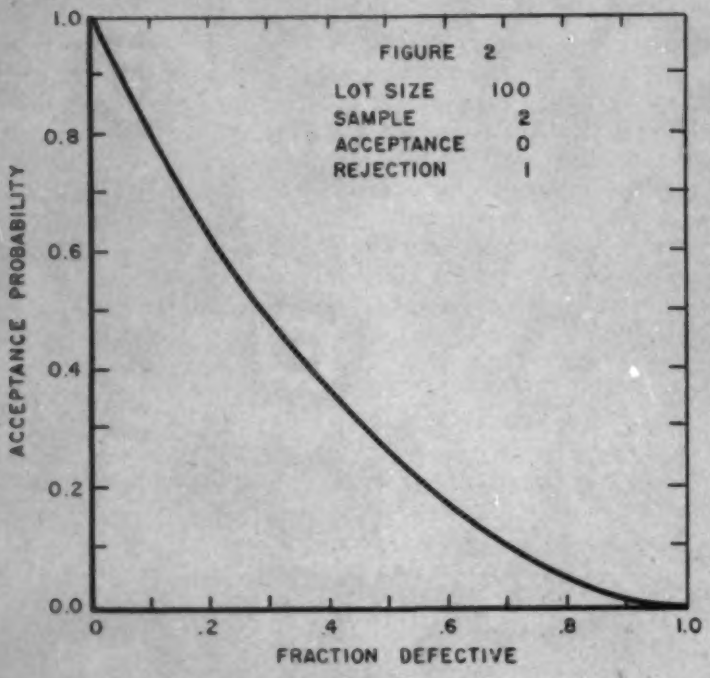
TYPES OF SAMPLING PLANS

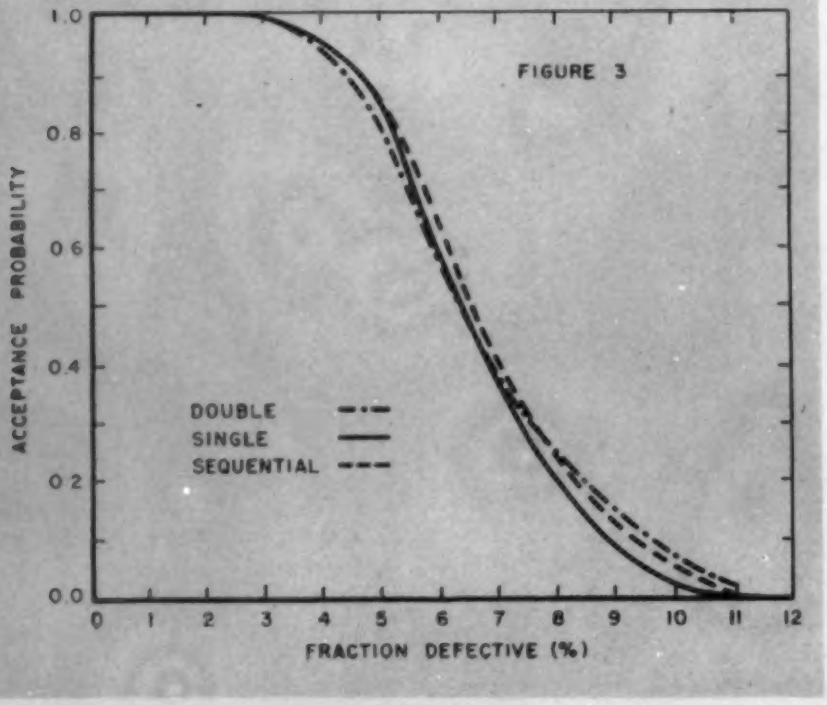
A better procedure would be to select a suitable type of sampling plan that has the desired operating characteristics for lots of given size. Such a plan would be applicable to a range of lot sizes. This arrangement makes it feasible to have a set of standard sampling inspection plans of various kinds that is usable for fairly wide ranges of lot sizes.

To illustrate what is meant by different kinds of sampling plans, the four examples that follow are given. These examples are taken from the work of the Statistical Research Group of Columbia University, soon to be published by the McGraw-Hill Book

From a paper presented at the annual conference of the National Institute of Government Purchasing, September 1947.







Company in a book entitled "Sampling Inspection." All persons interested in large scale purchasing will find this a most interesting book.

SINGLE SAMPLING

Lot Size Constant. Inspection lots of 3400 items are formed. From each lot a sample of 225 items is drawn. Each item is tested. If 14 or fewer items fail the test, the lot is accepted; if 15 or more items fail the test, the lot is rejected. This would be briefly characterized by saying: inspection lot size, 3400; sample size, 225; acceptance number, 14; rejection number, 15.

Lot Size Variable. Inspection lots of various sizes are formed and from each lot the inspector draws a sample of 10 per cent of the items in the lot. If 2 per cent or fewer of the items in the sample fail, the lot is accepted; if more, it is rejected. This is a widely used but bad procedure.

For small inspection lots, the lot size variable plan leads to too little inspection for adequate protection. If an inspection lot contains 10 items, then the sample consists of only one item. A lot that contained 50 per cent defective would have a 50-50 chance of being accepted. On the other hand, for large lots the plan leads to taking too large samples.

DOUBLE SAMPLING

Inspection lots of 3400 items are formed and a sample of 150 items is drawn. If this sample contains 9 or fewer defective items, the lot is accepted; if it contains 24 or more defective items, the lot is rejected. If it contains more than 9 but fewer than 24 defective items, a second sample of 300 items is drawn. If the total of 450 items inspected contains 23 or fewer defectives, the lot is accepted; if it contains 24 or more, the lot is rejected.

SEQUENTIAL SAMPLING

This is a generalization of double sampling and may be characterized by a table such as the following:

LOT SIZE, 3400 AND SAMPLE SIZE, 50

Sample	Size	Combined Samples Accept	Reject
1.	50	1	6
2.	100	3	9
3.	150	7	13
4.	200	10	16
5.	250	13	19
6.	300	16	22
7.	350	19	25
8.	400	24	25

The numbers under the heading "accept" mean that when the number of items defective is less than or equal to the number shown, the lot is to be accepted; those under "reject" mean that if the number defective is equal to or greater than the number shown, the lot is to be rejected; if between those two numbers, the next sample is to be drawn.

The operating characteristics of the three plans, single sampling with lot size constant, double sampling and sequential sampling, can be worked out by mathematical theory. They come out to be remarkably similar; in fact, the examples were chosen with this in view. (Fig. 3.)

We see that under these plans one would have a 50-50 chance of accepting a lot in which the per cent defective was 6.5 per cent. Because of the gradualness of the curve of the operating characteristics, it is better not to try to characterize it by a single fraction defective. Instead we may characterize it by the following two numbers:

Acceptable Fraction Defective. This is a fraction defective that if it is not exceeded the sampling plan will in the long run lead to acceptance of such lots in 95 per cent or more of the cases in which they are offered. Thus, the producer is assured that submitted lots of "acceptable fraction defective" or better will not, in the long run, be rejected more than five times in a hundred. In figure 2 the acceptable fraction defective is close to 4 per cent.

Objectionable Fraction Defective. This is a fraction defective that if it is exceeded the sampling plan will in the long run lead to rejection of such lots in more than 95 per cent of the cases in which they are offered. Thus the consumer is assured that submitted lots of "objectionable fraction defective" or worse will not, in the long run, be accepted more than five times in a hundred. In figure 2 the different sampling plans differ in regard to this value but all are between 9.5 and 10.5 per cent.

It turns out that it is generally possible to devise single, double and sequential sampling plans that have practically the same operating characteristics, as was done in the three examples illustrated in figure 2. This raises the question: What are the relative merits of the three types of plans?

It turns out on the average that for lots of acceptable quality or better double sampling requires the inspection of from one fourth to one third fewer items than does single sampling, and sequential sampling requires something like from one third to one half fewer items to be inspected than does single sampling. Hence if inspection cost per item is high, sequential sampling is indicated.

On the other hand, just because single sampling inspects more items it tends to accumulate more specific information about the nature of the defects. This is unimportant when no other use of the inspection procedure is made than to accept or reject the lots but it may be very important when the information is used in connection with quality control plans for spotting trouble in various factories.

The double and sequential plans, being more complicated, require more training of the inspectors.

Suppliers often prefer the double or sequential plans because they feel that they give a lot a second chance in case of "bad luck." This is, of course, an erroneous view, in that if plans are compared on the basis of having similar OC curves, the results are bound to be the same in the long run for the different plans.

Of course, in the absence of a definite plan, the inspector might introduce all sorts of variations, especially if he is being urged to do so by some party at interest This does not form the basis for sound practice.

GOVERNMENT and CAMPUS RESEARCH

T. E. BLACKWELL
Treasurer, Washington University

THERE IS AMPLE CAUSE FOR THE increasing demands of governmental agencies upon the universities of this country for a continuation and expansion of research programs begun during the war.

Although many contract details must be classified as "secret" and "confidential," it can be no secret that all the great nations of the world are engaged upon a frenzied race to pierce the "sonic barrier" that retards the future of aviation.

The necessity of preeminence in research for national survival imposes a heavy responsibility upon the universities of this county. We cannot refuse the requests of governmental agencies for assistance in research.

Yet this pressure for more and more governmental research contracts presents a peril of considerable magnitude to the universities. If the university laboratories are to continue to provide that peculiar environment in which research flourishes, university administration must protect and preserve that environment.

With governmental research contracts running into many millions of dollars per annum, American universities must take vigorous steps to see that this continued flood of federal funds does not imperil their way of life. With this in mind, a group of university business officers, last year, held a series of conferences, and later met with representatives from the armed services and the General Accounting Office in a cooperative effort to develop general principles under which the universities and governmental agencies might safely negotiate research contracts.

The fundamental principle on which these conferences were based was that government must take the universities as it finds them and must not attempt to dictate or dominate internal policies. This, we held, would be detrimental to the preservation of university tradition and way of life. This principle of "taking us as we are" was reflected in the demand that university administration must retain control over salary scales of members of its faculty engaged upon research and that the overhead or indirect costs of the contracts must reflect a cross section of the normal overhead of the institution.

As a result of these conferences, there was developed a basic manual entitled "Explanation of Principles of Determination of Costs Under Government Research and Development Contracts With Educational Institutions." It has received the official approval of the armed services, the General Accounting Office and it has been recommended for approval by the Bureau of Standards and by the Atomic Energy Commission.

CONSTRUCTION HAS BEEN STARTED ON A NEW SENIOR dormitory at M.I.T. to be ready for 353 men students by October 1 of next year.

The building was designed by the distinguished Finnish architect, Alvar Aalto, research professor at M.I.T.; the Boston firm of Perry, Shaw & Hepburn constitutes the supervising architects.

The outside of the building is to be of red brick to harmonize with adjacent buildings on Memorial Drive. It is just west of the main educational buildings facing the Charles River. It is to be of concrete fireproof construction and the interior walls of student rooms are to be of red tile. The heating system is low pressure steam, vacuum return, with convectors.

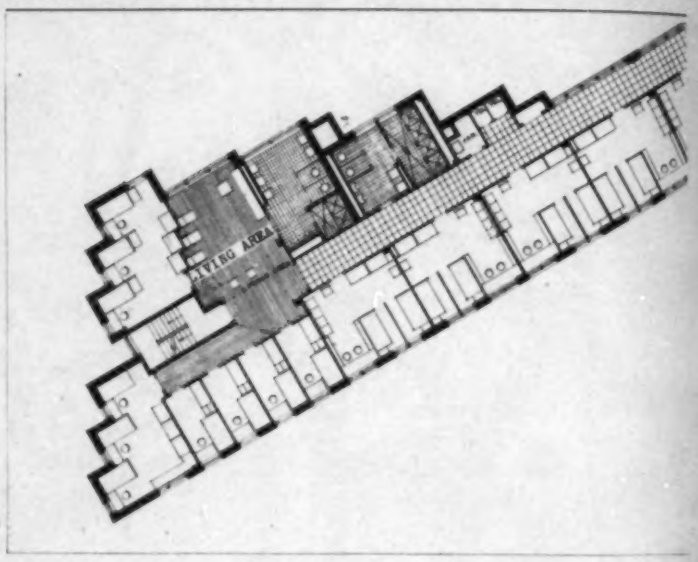
In order to have as many rooms as possible facing the Charles River Basin and Boston, the plan has been arranged as a combination zigzag and serpentine form to provide a maximum southerly exposure.

The building will be six stories high and one of its interesting features is the long cantilevered stairway that hangs from the north wall in a glass and aluminum enclosed addition, allowing continuous travel by easy stages to each floor. In addition, there are conventional stairways and an elevator.

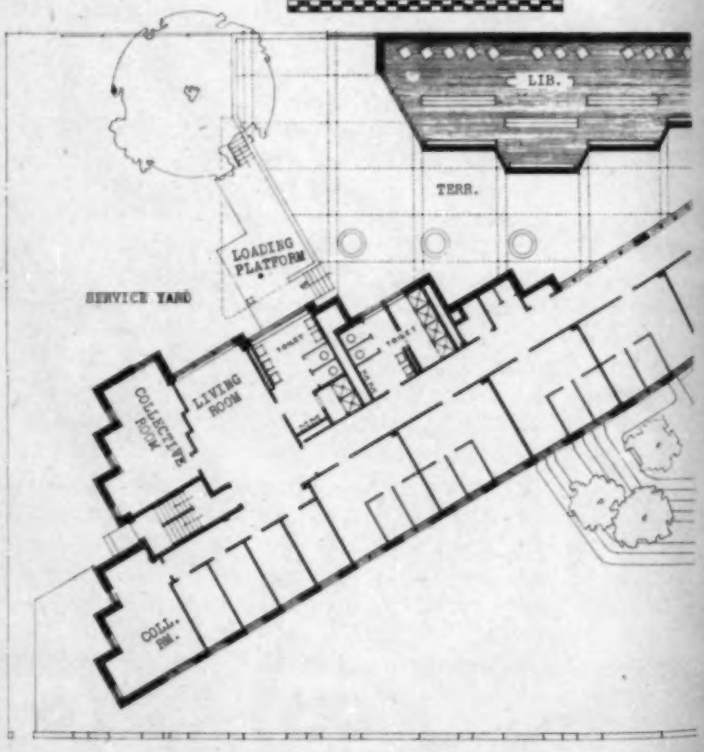
Each dormitory room, including singles, doubles and triples, will have acoustical ceiling and asphalt tile floor; it will be furnished with built-in desks, bookcase, wardrobe and bed, made of light blond hard wood to contrast with the red color of the tile walls.

The ground floor plan includes a music room, lounge and living room and hobby room. The first floor contains offices, house master's suite and some student rooms. The dining room is to be a one story wing facing the river with a balcony at the first floor level, making it an extension of the main lounge. It is to be lighted by numerous round skylights especially designed to provide daylight from above and artificial lighting by night.

It is expected that the total cost, exclusive of land, will be in the neighborhood of $1,800,000.



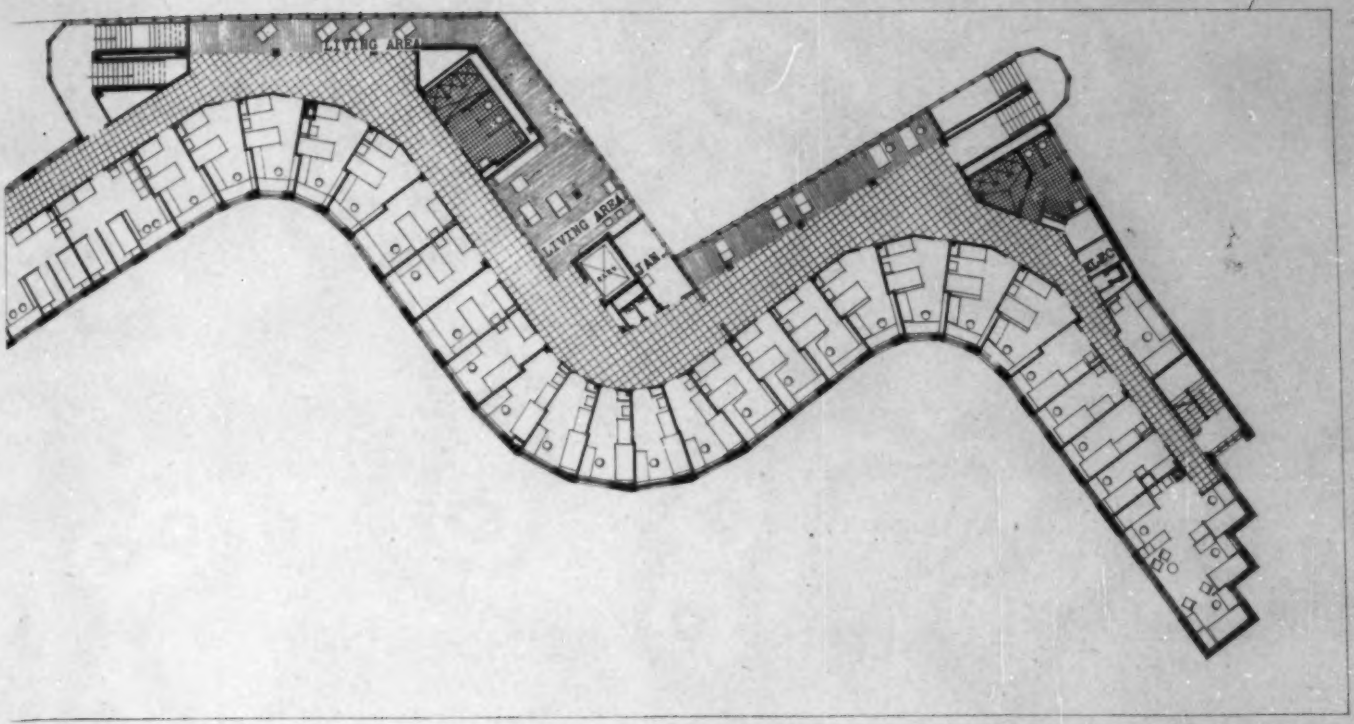
FIRST FLOOR PLAN



SERPENTINE PLAN SPREADS THE VIEW

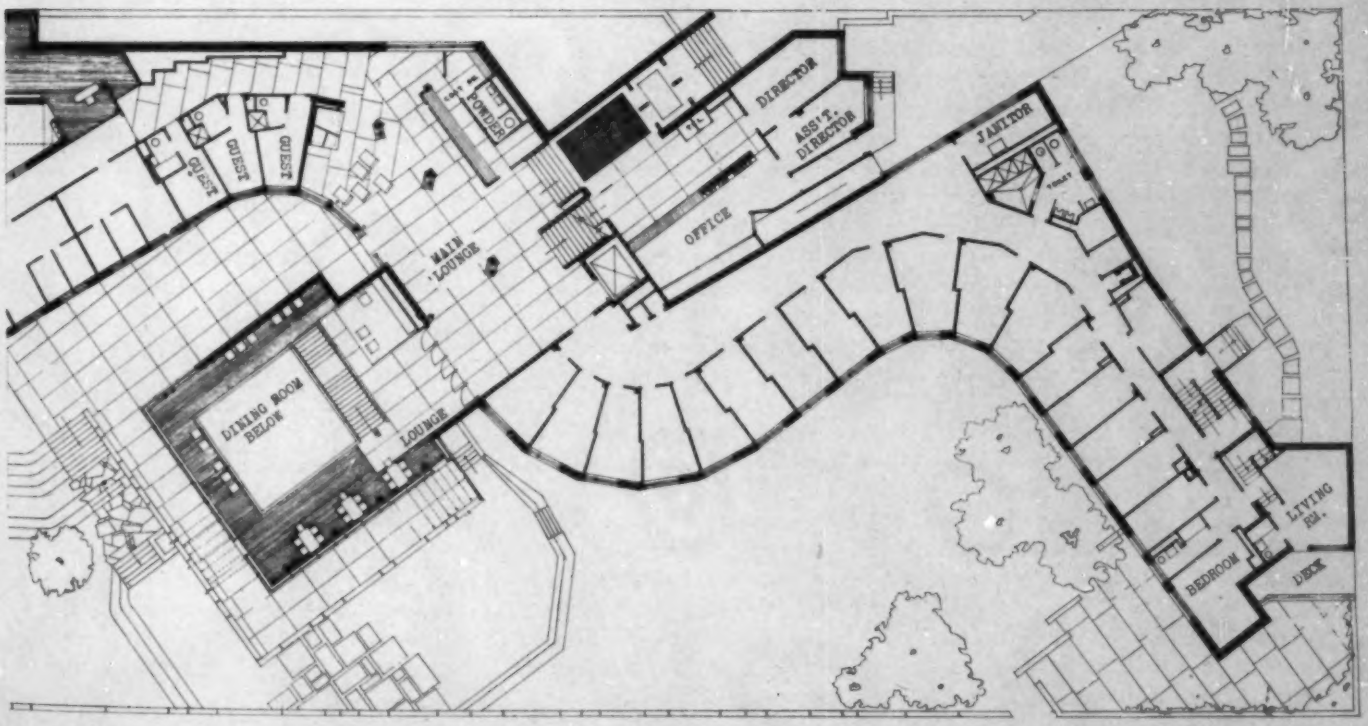
for senior men at Massachusetts Institute of Technology

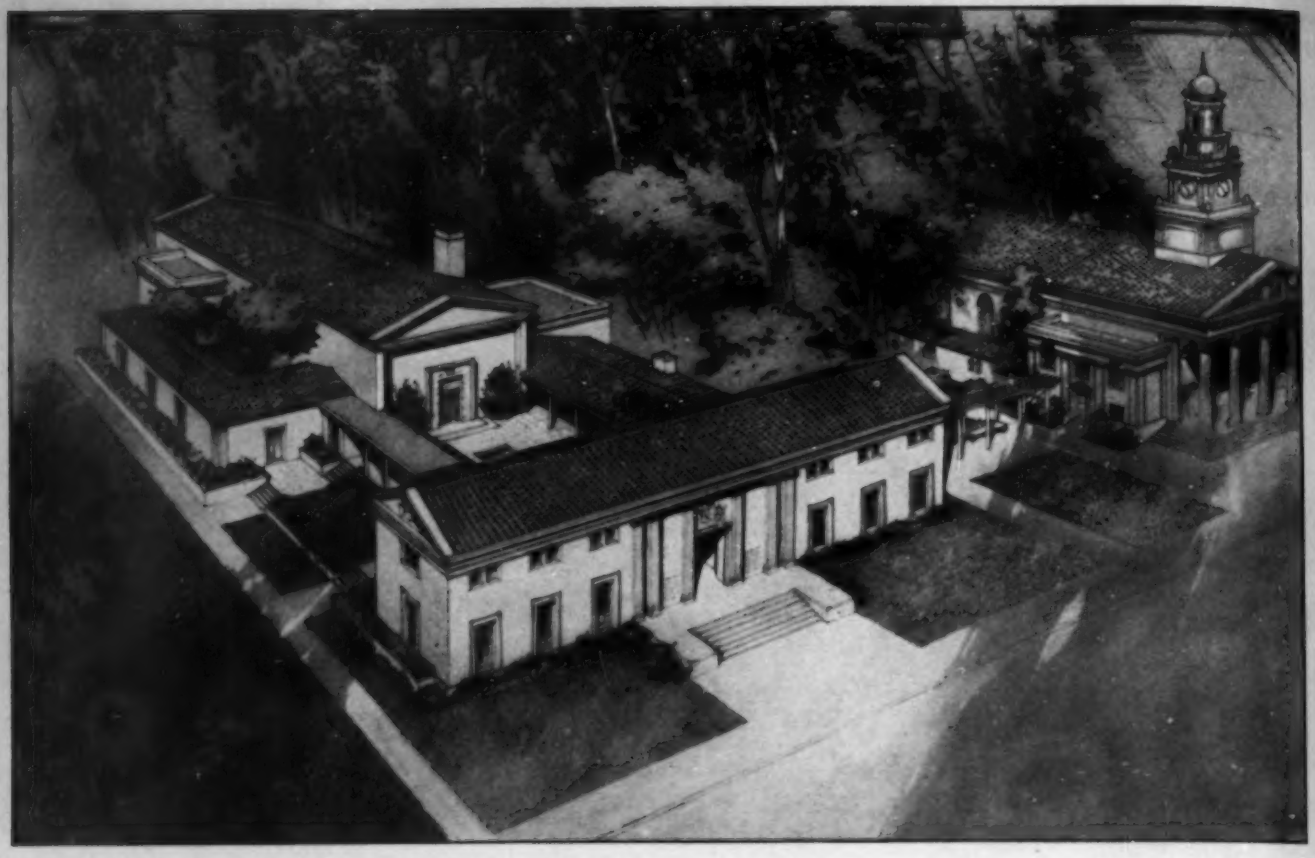
DELBERT L. RHIND
Bursar, M.I.T.



TYPICAL FLOOR PLAN

The upper floors, containing the student rooms, have collective living and lounge rooms with attractive living room furniture.





Music FACILITIES AT REDLANDS

GILBERT BROWN Jr.

Director of Public Relations
University of Redlands

THE FIRST POSTWAR BUILDING PROJect for the University of Redlands, Redlands, Calif., is a fine arts building with facilities especially designed for the school of music. The building, to be named Watchorn Hall, is a gift by the trustees of the estate of Robert Watchorn.

The principal feature of the building, which has been designed by Marsh, Smith and Powell, Los Angeles architects, is a concert auditorium seating 315.

Adjacent to the auditorium is an instrumental studio wing including a recording room. A patio in the front of the auditorium can be lighted for night use and is bordered on the east side by a lounge, kitchen and library.

Across the patio from the concert auditorium is a two story wing including offices, classrooms, studios and practice rooms. The fourth side of the patio is an open colonnade.

Plans include construction of reinforced concrete, tile roof and metal interior partitions. Stairs are of concrete; windows, double hung aluminum. Lobby, lounge and library are to have special wood paneling.

Linoleum has been selected as the primary floor covering, although asphalt tile will floor the auditorium; parquet wood, the library, lounge and lobby.

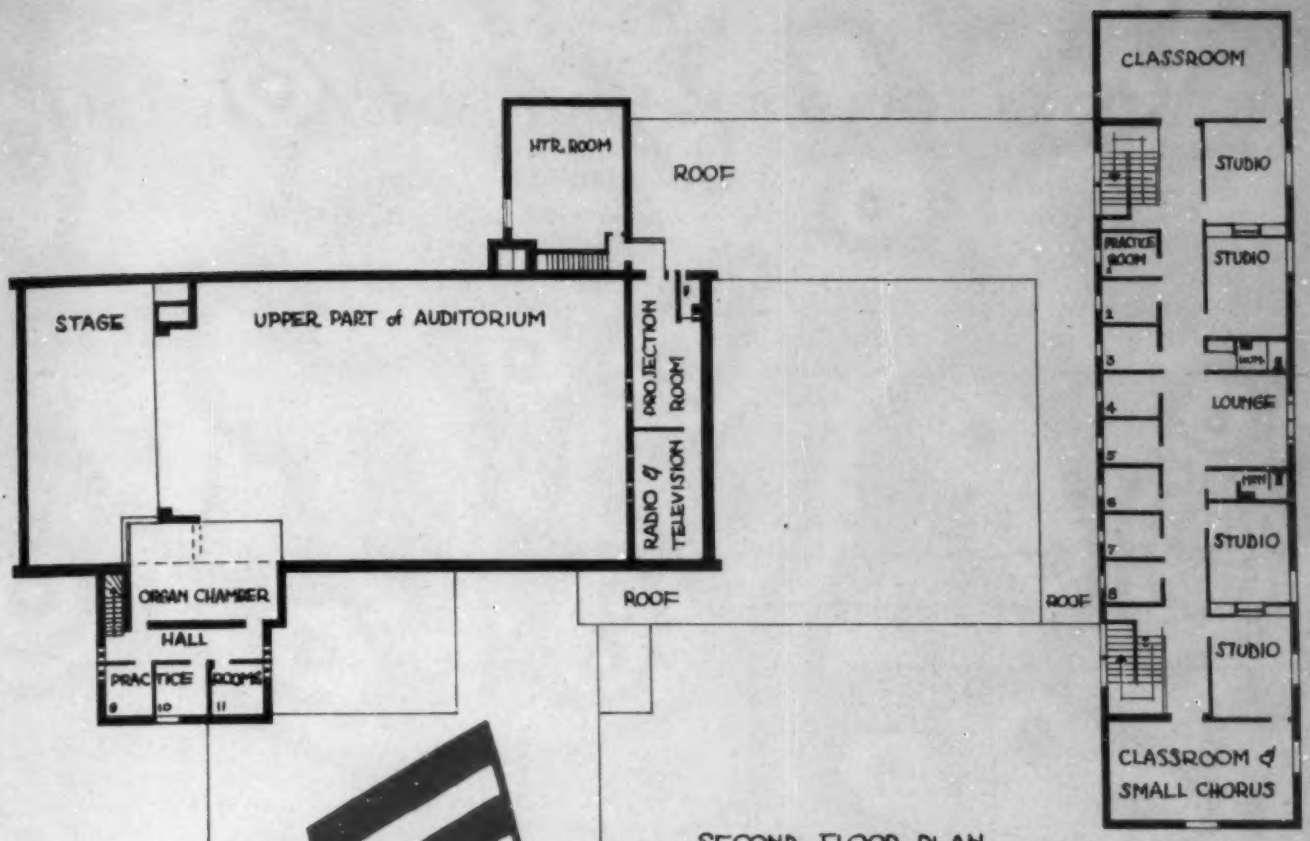
Plans also include complete acoustical treatment of walls and ceiling with soundproofed double doors to practice rooms and studios.

The heating and air conditioning system is divided into four units. Hot water from a central boiler and cold water from a refrigeration room are piped to the four fan locations and are distributed through ducts.

The auditorium is to have a projection booth and a deep stage with theatrical lighting equipment to make the building available for small theatrical productions. Provision has been made for an organ with especially lighted grilles. As in the other rooms, the lighting provides between 3 and 4 watts per square foot. The auditorium lighting is by means of a large number of circular fixtures of the flush type including 150 watt reflector lamps and concentric louvers. On the sidewalls at the ceiling is continuous indirect lighting.

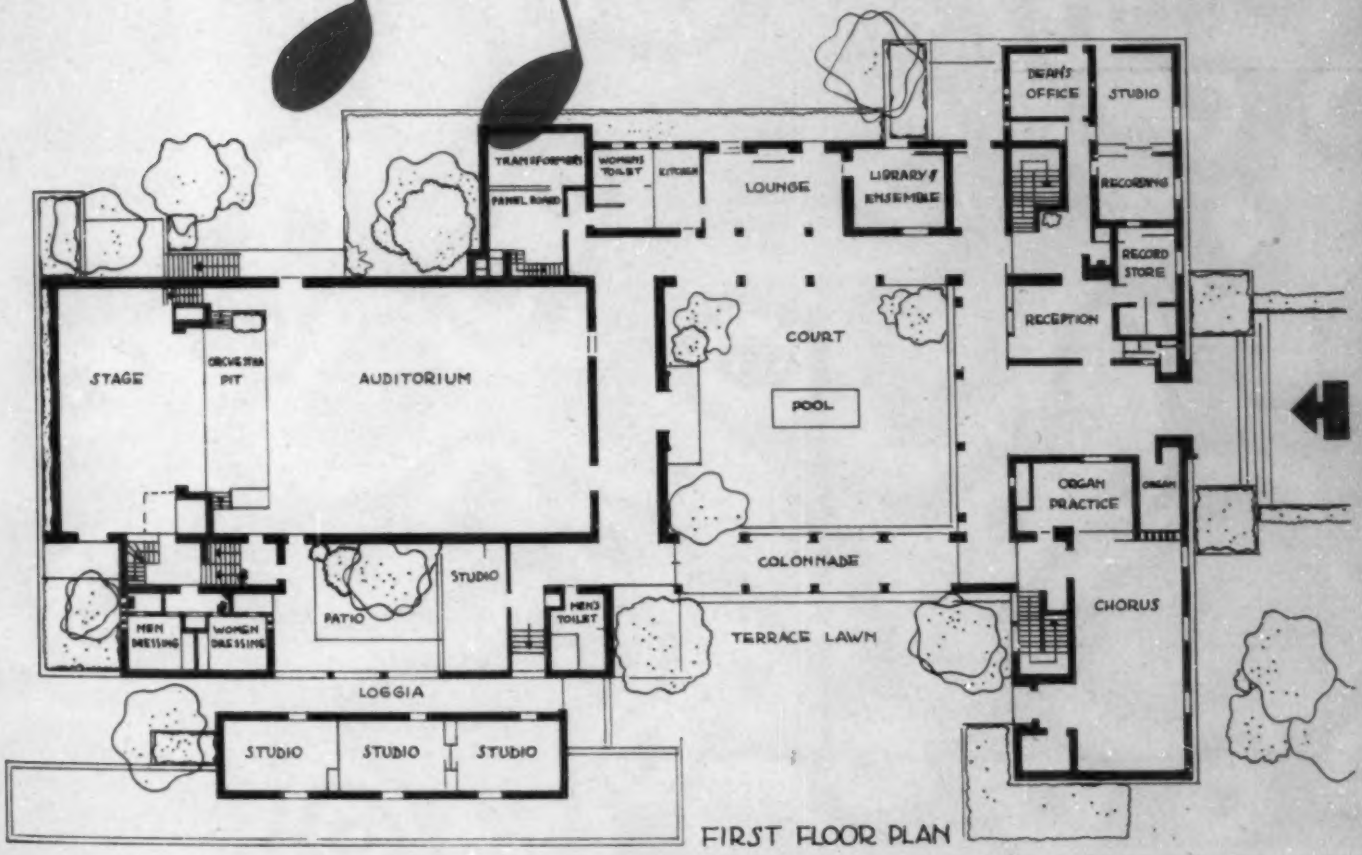
Decorative aluminum doors lead from the auditorium lobby into the patio, which is planned around a fountain with a bronze figure. Decorative aluminum doors feature the lobby entrance off the patio.

The estimated cost of the building is $400,000.



SECOND FLOOR PLAN

STUDIOS, classrooms and practice rooms occupy the two story section of the new music building.



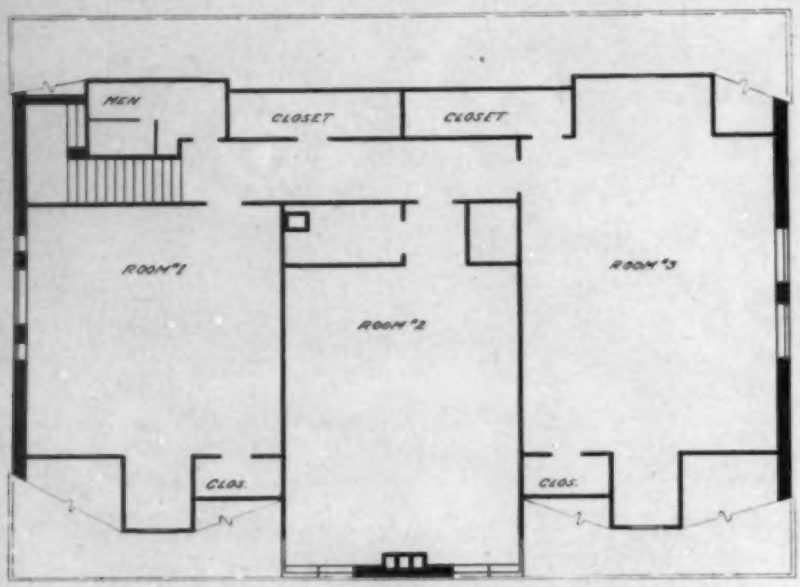
FIRST FLOOR PLAN

PATIO in front of the auditorium may be night lighted for concert use. Kitchens occupy one side of the patio; the two story wing is on the third.

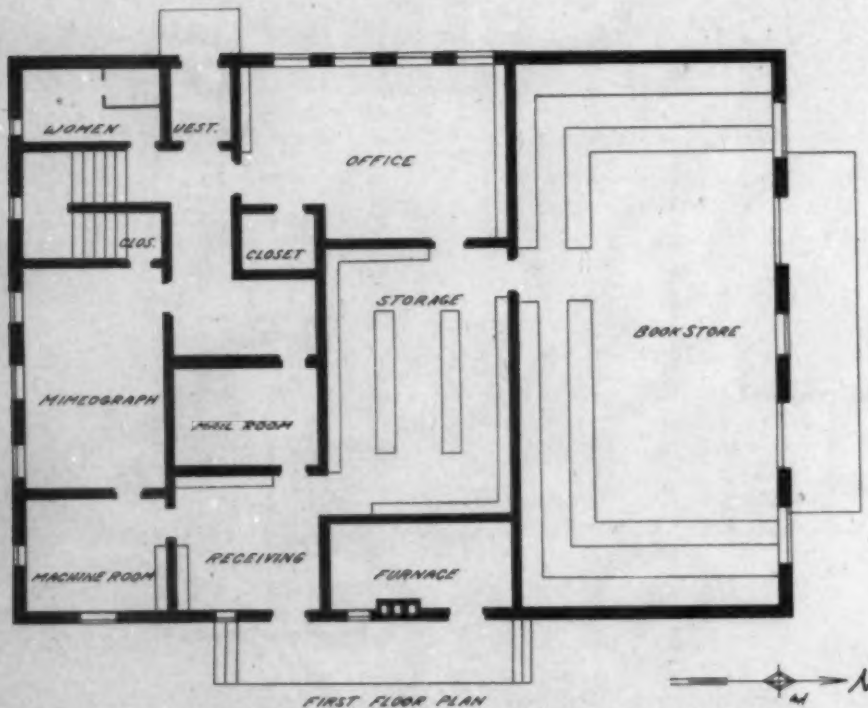
THE BOOKS COULD BURN BUT NOT THE BUILDING

GEORGE CHURCHILL
Director of Public Relations
University of Tulsa

THE UNIVERSITY OF TULSA'S NEW bookstore is a completely fireproof building with an exterior of red sand brick and with interior partitions of exposed hollow cement bricks. Windows are of steel and glass; stairway construction is of steel and concrete. The concrete floors are covered with asphalt tile in brown and green. Walls throughout are finished in pale green.



SECOND FLOOR PLAN



FIRST FLOOR PLAN

A pressed fiber covering in cream color has been used for the ceilings.

Counters are of bleached wood with two 3 foot sections on either side of a U-shaped arrangement in glass used for display purposes. The dates that classes are in session are not fixed definitely but they do not include the worst heat of the summer; therefore, the only air conditioning called for consists of fans circulating air throughout the interior. Fluorescent lamps on extended fixtures, at a height of 8 feet from the floor, furnish all artificial lighting.

The overall cost of the building, not including the site, was approximately $40,000. It was completed in the fall of 1946 in time for first semester enrollment. The present staff of the bookstore includes four full-time employes and three student or part-time workers in addition to Ella Fitzgerald, the manager.

Because of the dire need of space for faculty personnel and classrooms, four university departments are temporarily housed in the upstairs section. The second floor is used as office space and provides a special university lounge for student and for faculty meetings.

The first floor, in addition to space for the bookstore and its offices, storerooms and receiving rooms, contains the university post office, shipping room and mimeograph room. Twenty persons make use of the space on the two floors of the bookstore.

"In addition to 30,000 volumes of books for all classes on the campus and in the downtown division, we keep a stock of necessary supplies for laboratory and research work," Miss Fitzgerald, the manager, declares. "This includes T-squares, ink, pencils, brushes and incidentals required by the professors."

Candy, stationery and greeting cards also are displayed; baby clothes attract particular attention at one counter and, according to Miss Fitzgerald, prove popular with veterans' families.

PROFESSORS IN PRE-BUILTS

Grinnell College solves a housing problem

LOUIS V. PHELPS
Treasurer, Grinnell College

"WE'LL BUILD," CONCLUDED PRESIdent Samuel N. Stevens of Grinnell College, Grinnell, Iowa, after we had canvassed town housing facilities for our swelling faculty list.

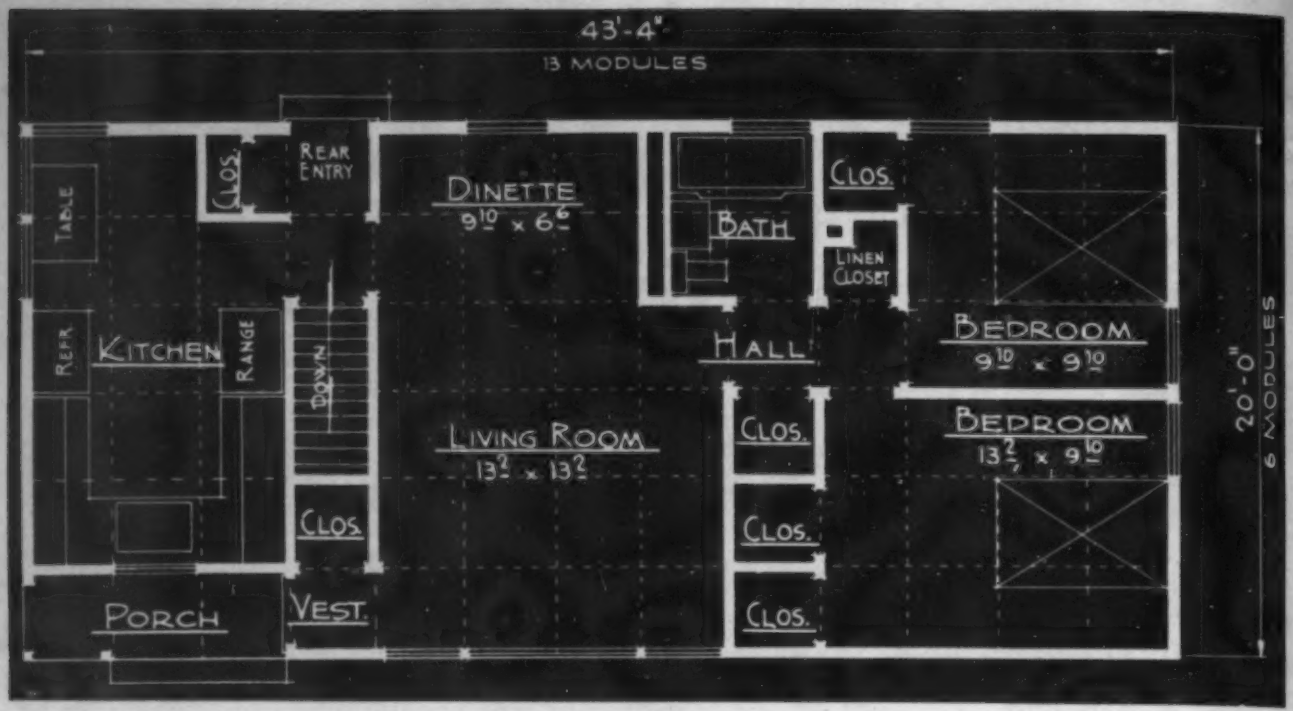
We decided it would be cheaper in the long run and more beneficial to both college and city to erect houses rather than to remodel existing buildings into apartments.

As a result, September found ready for occupancy 10 prebuilt one story houses in both two bedroom and three bedroom styles. Grouped in twos and threes in different locations (the farthest is 10 blocks from the campus, the nearest, five blocks), the new homes avoid both the carbon copy look and faculty row typing.

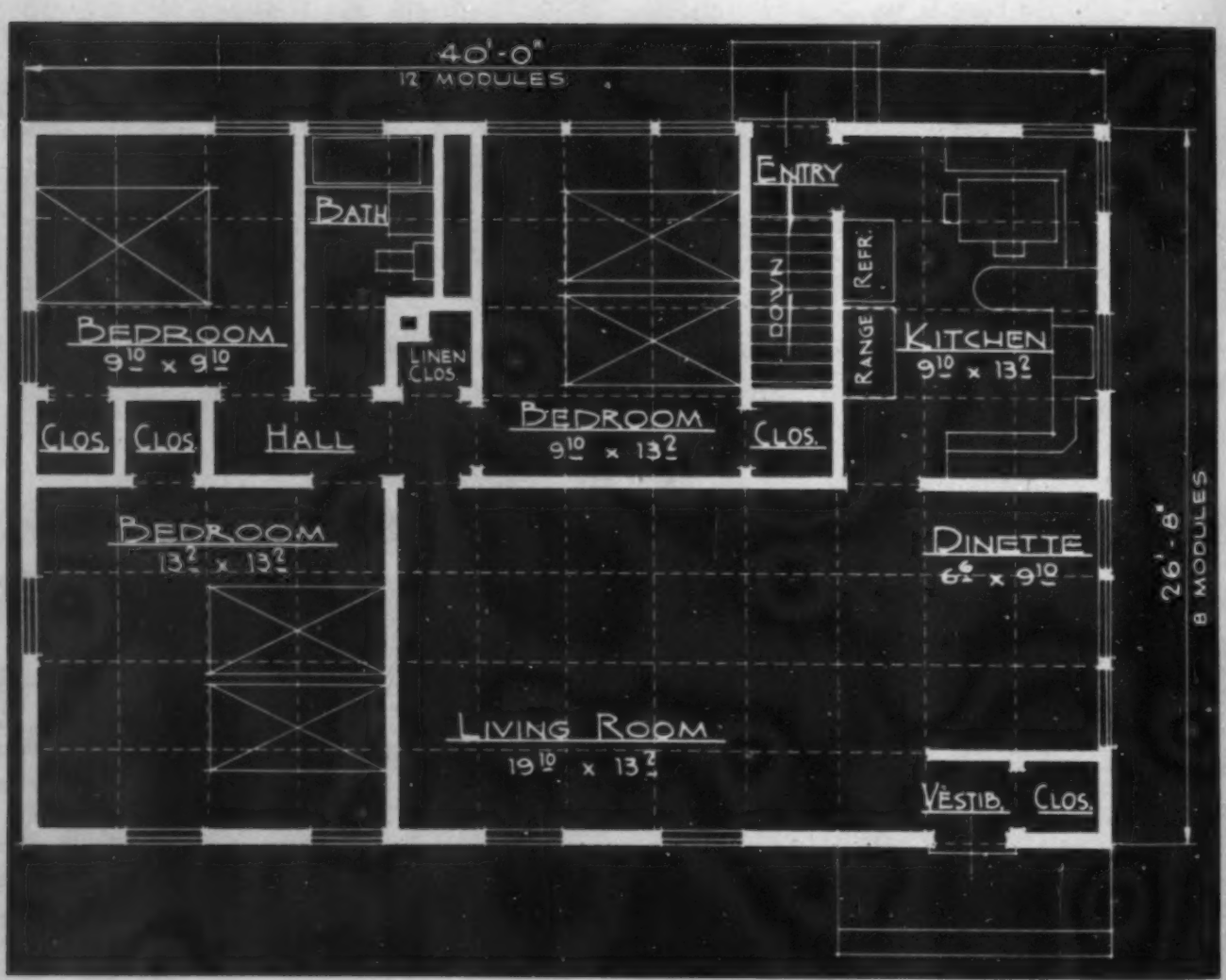
The houses rent at $70 and $75, are being financed individually through F.H.A. and can be bought by the tenant outright whenever he wishes. Rent cannot be applied to the purchase

Supply the shutters and the landscaping and you'll get a better notion of how the 10 new houses will look.

Electric stoves and refrigerators, good sinks, cabinets and counters make for convenience in food preparation.



PLAN OF TWO BEDROOM HOUSE



PLAN OF THREE BEDROOM HOUSE

price, which is $10,000 or $11,000, including the lot.

Not only has the tenant an option to buy, but if he wants to sell the college puts no strings on the deal. He does not have to sell to some faculty member.

Contracts for the 10 homes were let May 7, with work to be done by college labor, and all buildings ready for occupancy September 10. We chose the pre-builts of General Timber Service, Inc. of Dubuque, Iowa, distributed by Weyerhaeuser Sales Co. of St. Paul, Minn. The houses, in four different styles, were designed by Norman Johnson of St. Paul.

Both the two bedroom and three bedroom style of house has a full basement. All houses are of frame construction, pre-built in 40 inch panels, set on masonry foundations. Overall measurements vary from 20 by 43 1/3 feet or 26 2/3 by 33 1/3 feet for the two bedroom styles to 26 2/3 by 40 feet for the three bedroomers. Interior partitions are of gypsum plaster board, floors, of ¾ inch oak. Inlaid linoleum is used in the kitchen and bath. Roof is of composition shingles, double-thick butt, laid 4 inches to the weather.

Sidewalls and ceilings are thoroughly insulated; joints are calked under pressure. Rooms are wired with ceiling fixtures, with an abundance of wall plugs. There are chimes for both front and back doors.

Kitchens are equipped with electric stoves and refrigerators and with high quality sinks and cabinets.

The homes are heated with oil-burning furnaces equipped with humidifiers. Basements have laundry tub connections.

Occupants of the first house moved in August 16, work having been started on the home July 9.

By using different styles and by mixing the exterior colors of gray, white or ivory within a single grouping, each section of homes achieves variety. As for interior colors, faculty wives are allowed to choose their own tints of conventional soft pastels.

The lot sizes range from 70 by 75 feet to 84 by 165 feet and average $750 in cost.

Factory cost of the two bedroom job is $3600. The average cost of heating and plumbing was $1500; for electrical work, $185. Masonry, shingling and flooring figure at approximately $2215; kitchen equipment, $800. Labor is listed for $950. The college is installing sidewalks and doing the landscaping.

FIELD HOUSE ON GRAND SCALE

THE MAMMOTH NEW FIELD HOUSE at Eastern Washington College, Cheney, was reerected last summer from a navy drill hall at Farragut, Ida.

Dismantled and moved in sections from the naval base to Cheney, the 610 by 120 foot building occupies space equal to two city blocks. An area the size of 10 city blocks was leveled, graded and surfaced in preparation for its placement.

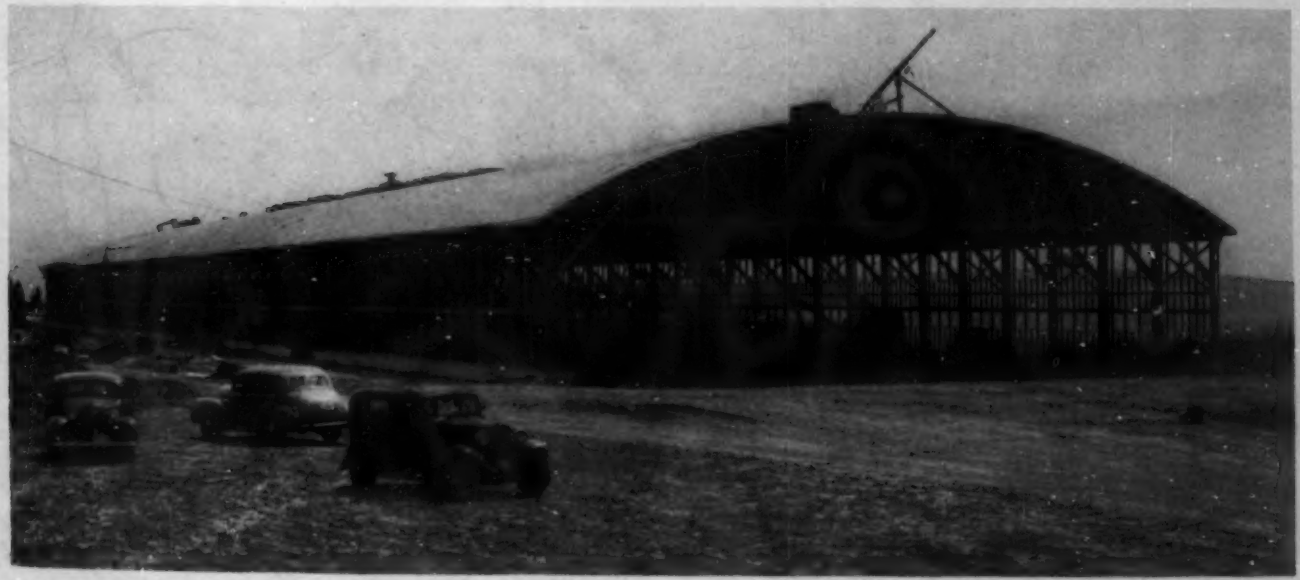
Between November 1946, when approval for the building's release to the college was granted by the Federal Works Agency and War Assets Administration, and March 1947, when the $306,900 contract was let, three bids for its removal and reerection on college property were rejected as being too high.

Featured by a swimming pool redesigned for every type of swimming contest, the field house provides one of the finest athletic plants in the West. Five basketball games can be played at once.

Half of the field house has been left unfloored so that outdoor games can be played indoors all winter. In addition to basketball, handball and volley ball courts, it provides space for classrooms in physical education and in health work; there is also a corrective gymnasium.

In the field house is a 17 room band and orchestra unit, which includes a practice room for a 125 piece band, music libraries, offices and solo and ensemble practice rooms. Floors are birch hardwood; walls are ¾ inch plywood with 2 inch roof insulation.

The building has its own heating system employing steam radiators and unit heaters. It is lighted according to requirements of the individual rooms. A public address system is promised.



Covering the area of two city blocks, this field house contains courts, pool, band room and classrooms.

LIFE IN A STUDENT VILLAGE

GEORGE F. BAUGHMAN
Assistant Business Manager
University of Florida

TO PROVIDE LIVING FACILITIES FOR veterans and their families, the University of Florida, in common with many other colleges and universities, inaugurated a housing project for married students.

This project, the largest of its type in southeastern United States, consists of three villages named Flavets I, II and III.

Flavet is the contraction of Florida veterans, a name chosen for this project by the university. All buildings are located on the campus in the perimeter of the academic buildings.

Flavet I, the first of the three projects, was officially open in February 1946. It is located south of the infirmary and is surrounded by a magnolia grove.

Flavet II, which is just south of the university's Agriculture Station, is situated on a rise overlooking the grazing grounds and is bounded on the west side by large oak and pine trees.

Flavet III is on a knoll rising to the southwest of the university's military grounds and is completely surrounded by magnolia, pine and oak trees.

The project has been constructed in conjunction with F.P.H.A.; roads within the projects have been provided by the state road department. Flavet I and Flavet II are one story buildings constructed of prefabricated building board with fireproof shingle roofs; Flavet III is composed of converted two story barracks.

Six hundred and twenty-four student veterans and their families are now housed in these villages. Flavet I contains 26 buildings divided into 100 apartment units with one, two or three bedrooms. Flavet II contains 20 buildings divided into 76 apartment units with one, two or three bedrooms. Flavet III contains 54 buildings which provide 448 one or two bedroom apartment units. Construction was halted on 152 of these units when F.P.H.A. funds were exhausted. The university is completing these and new federal funds are now available.

Each apartment has a living room, kitchen, bath and bedrooms in proportion to the size of the family. All apartments are equipped with new living room, bedroom and dinette furniture, gas space heaters, gas stoves, iceboxes and fire extinguishers. Residents must supply their own linens, rugs and kitchenware. The veterans pay for their gas consumption through a contract agreement with the local utility company. Water and electricity are furnished by the university, with residents who use refrigerators, washing machines and fans paying a slight fee to cover the additional electricity consumed.

Each family signs a contract agreement with the university before occu-

pancy, covering all provisions under which units are rented. Also before occupancy, an inventory of the furniture is signed, which makes the resident responsible for damage done to university owned furnishings.

The villages have daily mail deliveries, garbage collection and police and fire protection. While the university is responsible for the general upkeep of the village grounds, each resident is asked to assume some responsibility for the ground immediately surrounding his unit and for the village in general. The university supplies each village with certain tools and lawn equipment; these are available for loan to the residents wishing to keep up and improve their units.

Village speed limits are marked at 15 miles an hour, and all project managers are deputized for traffic and internal police control. The villages are covered by the state road patrol.

Various commercial concerns in Gainesville are allowed access to the villages, enabling the residents to have door to door services. However, before a vendor may enter the villages, he must be approved by the office of the business manager and must agree to abide by certain regulations covering the number of calls to be made per day and the speed limits within the villages; he must have his trade vehicle properly tagged.

VILLAGE GOVERNMENT

Some of the student veteran project managers have had previous F.P.H.A. experience. A well selected student manager can serve approximately 100 units. The use of residents as managers has permitted excellent tenant-management relations, for the manager and the residents live under identical conditions.

Division of each village into political districts makes possible the operation of a representative form of government by the election of commissioners from each district and by the subsequent election of a mayor for each village. These student governments have taken the responsibilities for most internal disciplinary problems and are always ready to help the project manager.

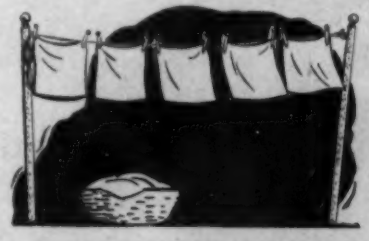
The commissioners and mayors conduct a regular business meeting once a week, bringing forth suggestions for the betterment of the projects. Their term of office is in accordance with the school terms and a new election is held each term. By the efforts of various committees appointed within each village, ground improvements and recreational facilities have been successfully undertaken.

The three villages have succeeded in obtaining help from various civic organizations in Gainesville and have installed wash houses equipped with electric washing machines, available for use by the residents at a nominal charge. The American Legion has donated playground equipment to the three projects, providing adequate and safe recreational facilities for the children. Each village has a centrally located bulletin board available for all university notices and for any notices residents wish to post, such as items for sale and help wanted.

One of the most successful of the postwar organizations on campus is one patronized largely by the residents of the Flavet villages, the Student's Cooperative Exchange Incorporated. This organization, started by a group of students who spend many months studying the pros and cons of a grocery business, offers to its members a complete line of canned goods, produce, meats and dairy products at prices lower than those in the local grocery stores.

Incorporated under the nonprofit laws of Florida, it is located in a quonset type of building provided through an appropriation of the state legislature; the building is rented by the corporation for $2 a year.

Each of the 650 members of the Cooperative Exchange has paid $15.50 for the privilege of purchasing from this store. However, $15 of this amount is refunded to the student when he withdraws his membership. Operation of the store, including all general policies pertaining to membership and operation, is in the hands of a board of directors elected from the members. The store manager has had more than ten years' experience in the grocery business. He is responsible for the actual buying of goods and for the inner working of the store and its employes. The mark-up is approximately 10 per cent over wholesale prices on goods; any profits that may accrue are given back to the members as a saving, through a system approved by the board of directors. Meetings of all members take place on specified dates; all members are urged to attend in order to offer criticisms and suggestions for better service and operation of the store.



Although each village is protected by the Gainesville fire department, Flavet III, the largest of the three projects, has its own volunteer fire department. Male residents of the village are asked to volunteer for this fire brigade and, after acceptance, receive an intensified training covering every important phase of firefighting called for.

The training class is conducted by a fireman with twenty-five years of fire-fighting experience and the men take part in drills. Some 25 per cent of the present members of the fire brigade had fire-fighting experience during their period of war service.

FIRE PROTECTION

A fire house has been constructed immediately adjacent to the project manager's apartment and is readily accessible to volunteer operations throughout the entire project. A 150 gallon pumper fire truck was furnished by the War Assets Administration and every man on the fire force is taught how to operate this truck.

A central fire alarm can be heard throughout the village, which has been zoned to enable the Gainesville fire department to locate any fire immediately. Although the volunteer fire department is maintained in such a way that it is always ready in case of emergency, it is operated only as a supplement to the Gainesville fire department.

In addition to the fire extinguishers furnished the individual apartments, each second story apartment at Flavet III is equipped with a fire escape balcony and ladder.

From their beginning, these projects have been successful in providing pleasant, inexpensive living accommodations for the majority of the married veterans on the campus. Within the villages there is a wonderful sense of cooperation, neighborliness and contentment. The residents are proud of their temporary homes and take an active interest in beautifying the surrounding grounds.

LET THE WEATHER CONTROL YOUR HEAT

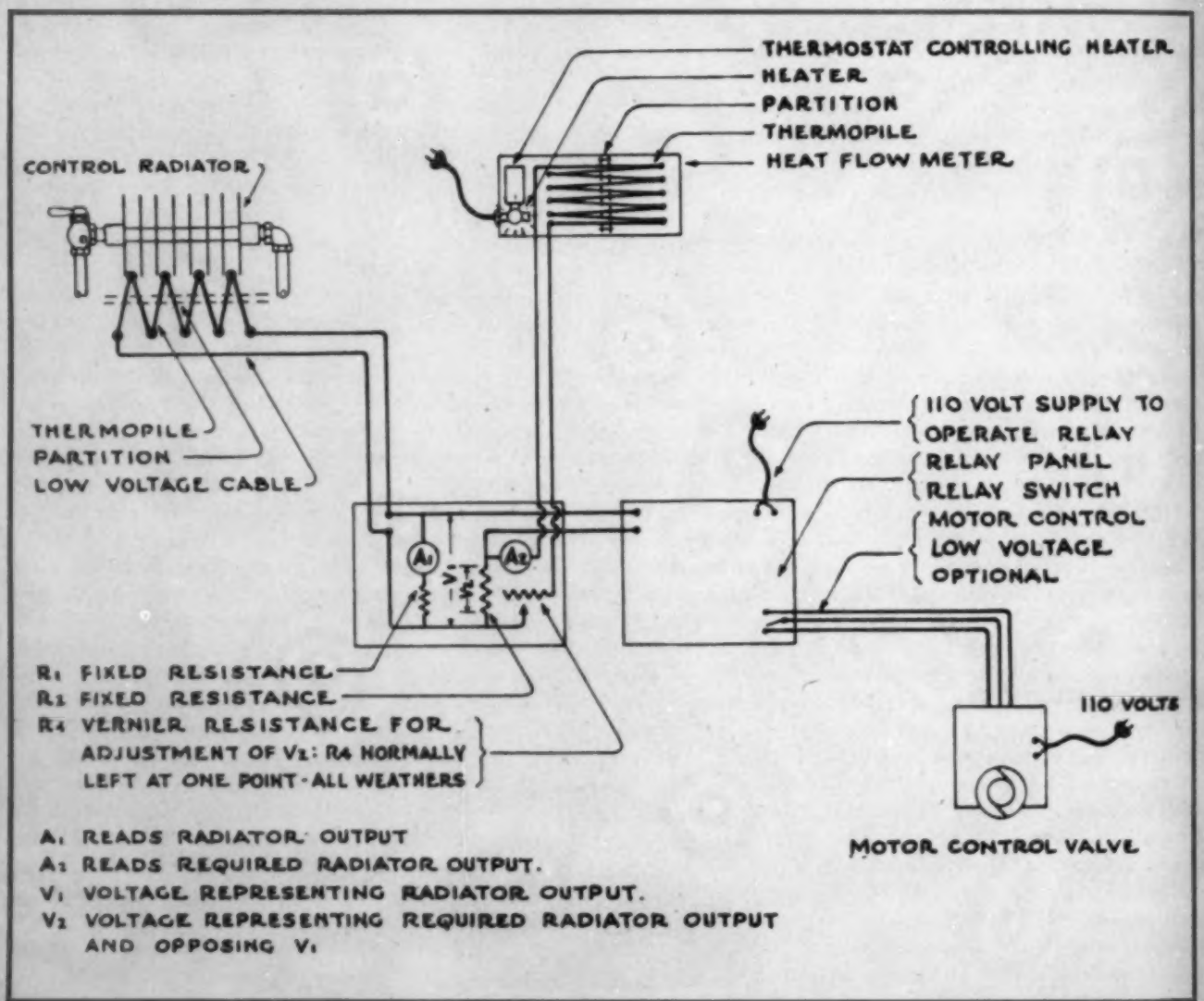
ANDREW SIMPSON
Superintendent, Swarthmore College
Swarthmore, Pa.

THE COST OF ALL FUELS HAS INcreased rapidly. The cost of heating controls has also increased but not nearly as rapidly. The ingenuity of American manufacturers has brought into the market many new controls and it is now possible to install a reliable fuel saving system at a cost lower than that of 10 years ago. Most of these devices control not by the temperature at some spot inside the building but by the temperature, wind velocity and amount of sunshine outdoors. They measure the need for heat and so in truth do control by the weather.

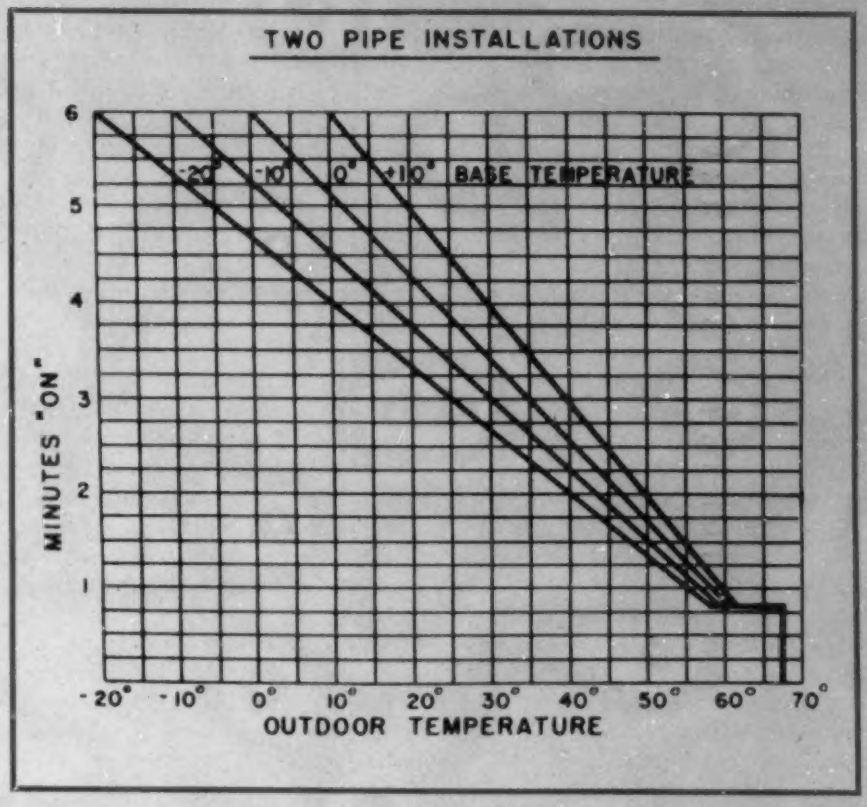
Every new study of the economics of heating proves that it is essential to use controls of some sort. No longer are we victims of the janitor's lassitude in reducing to the minimum the amount of fuel burned. This is true even for small temporary buildings in which the cost of labor has in many cases dictated the use of automatically fired fuels. Such systems are never installed with manual controls.

Many of the buildings which clutter up our campuses and which we hope are temporary were erected in such haste that little thought was given to comfort or to cost of operation. Most of them were paid for by the taxpayers. But as the cost of operating them must be scraped from our own budgets, we must think now about improving efficiency of operation. Weather controlled heating may be one of the answers. This article attempts to develop a set of criteria for choosing this apparatus.

Obviously, individual room thermostat systems cannot be considered. They are expensive even when installed during building construction. Maintenance costs cannot be disregarded. Often they do not save as



The chart at the right shows the length of time the steam stays on in the heating system on each cycle for various ranges of outside temperature.



much as we think they should save.

Control systems pay for themselves by the savings they effect in mild weather and it is in this weather that some of these systems fail us. All of us with operating experience know that the conventional 70° F. at the thermostat does not satisfy the occupants of our buildings in midwinter when exterior walls and windows are cold. We push up our thermostat settings and then do not readjust them in the spring.

On sunny days with the outdoor thermometer at 60° F., with warm walls and glass, the occupants of our buildings feel hot, and so they are because all pipes up to the radiator valve are filled with steam. So the windows are opened and the boiler flowmeter pens move up as the thermostats try to heat all outdoors. Perhaps the answer is to add to the system an inexpensive outdoor weather control which will turn off all steam from the building piping when the weather is warm.

WHERE TROUBLE STARTS

For buildings without control systems we sometimes try to govern large zones with one thermostat installation, forgetting that in so doing we assume that the zone heats equally and that the thermostat location is typical. There our trouble starts. Whether the heating medium is steam or hot water or warm air it seldom distributes uniformly.

Steam, probably the commonest heat conveying fluid, when fed slowly into the average heating system distributes according to pipe friction, rate of air venting or the common perversity of inanimate things. Some radiators may be fully heated before others even feel warm. If steam is fed intermittently in large doses, distribution is generally better but water hammer noises may be unbearable.

The only effective control of distribution is by radiator and pipe orifices. The design of the orifices is not difficult and it need not be too accurate. If the first sections of all radiators can be made to heat simultaneously the problem is more than half solved. Reasonably good distribution of the heat is necessary for any kind of heating system if it is controlled as a whole by one thermostat, by an outdoor weather device or by a simple intermittent flow timer.

Even with good heat distribution it has been said that the use of one thermostat to control a large building, or a zone of one, is beset with three difficulties: (1) long on-off periods because of the great mass, or heat storage, of the building (long off periods cause what is known to the heating trade as "Cold 70"); (2) local interference, and (3) choice of proper location.

It is obvious that if heat distribution is good and exposures are not too different, there is no problem of correct location. Local interference is a real problem, more human than technical. Even locked thermostats succumb to the manipulation of hair pins and paper clips! Short on and off periods can be obtained by the use of a properly chosen "heat accelerated" thermostat. There are several on the market.

But a better solution and generally a cheaper one is the use of an outdoor weather type of control.

The general scheme of operation of the outside type of temperature control can be illustrated by a study of one of the first and simplest instruments. It was basically a contact making pressure gauge. Pressure to actuate the gauge was provided by a closed liquid filled system consisting of two bulbs and the necessary capillary tubing to connect them to the instrument. One tube was placed outdoors, the other on a radiator. Thus one bulb measured heat demand, the other measured heating system response.

With both tubes at the same temperature the gauge was ready to make the contact calling for heat. If the outdoor bulb cooled, the indoor bulb had to be heated in order to satisfy the instrument's call for heat. As the interior bulb had only one half the volume of the other, the radiator, or at least that part of the radiator to which this bulb was attached, had to heat twice as fast as the outdoor bulb cooled. That is, if the outdoor temperature dropped 70° F. to zero, the radiator had to heat 140° F. to a final temperature of 210° F. Some modification of bulb sizes would allow the device to control hot water or warm air heating systems.

This first instrument was too crude to be practical. Nevertheless, a study of its advantages and defects will

illustrate what such a control should and should not do.

In the first place it waited for heating system response even though it did not measure the response accurately. It measured the demands for heat, that is the weather conditions, about as accurately as most modern instruments. It was sluggish, with long on and off periods. To prevent overheating in mild weather, when used with steam heat, the bulb had to be placed close to the radiator valve. The bulb then telegraphed the same information whether one section or all were hot. Splitting the bulb into four or five smaller bulbs and spreading them on the radiator helped.

If the device was adjusted for comfort in zero weather it might still call for some heat at 80° F. outdoors. Night shutdown was easy—it always is—but morning warm-up required a transfer of control to thermostat or something equally complicated. Adjustments were difficult to make and impossible to reproduce.

A greatly refined instrument of the same general type is now marketed by one of the largest and most responsible manufacturers of control equipment. The first crude instrument is discussed only to develop the following criteria for judging such devices.

JUDGING OUTDOOR CONTROLS

1. *Does the instrument have sufficient range of adjustment?* The range required is large. A direct radiation system fed by steam through a reducing valve may require steam in mild weather for only one minute in a twenty-five or thirty minute cycle. At the other extreme a small stoker may have to run ten minutes in an hourly cycle to heat the first sections of radiation. One widely advertised and mechanically excellent instrument will not call for heat for less than one eighth of the cycle.

2. *Does it require seasonal adjustment?* This equipment is purchased to provide automatic control. The heating engineer is willing to adjust it carefully, perhaps under several different weather conditions, then he wants to leave it alone. The temperature at which heat is cut off entirely should not be changed by any other adjustment. This temperature is around 65° or 70° F. Adjustment of the instrument in midwinter should not affect it.

Unfortunately, many of the devices fail badly in this important respect. In others the mild weather cut-off point is affected slightly by cold weather adjustments. In at least one the outside dial, which can be manipulated (even when the instrument is locked) to take care of high winds, will change the whole range of the control. It is in effect only semi-automatic.

These criticisms are valid only if the instrument is supposed to be fully automatic. For large buildings in which some personal attention by a custodian may be desirable a semi-automatic control might be preferable. But for a small building or even for a large one where no one has time to adjust the control, it is a serious mistake to choose a semi-automatic device, that is one that requires adjusting for major weather changes.

3. *Does it measure response of the heating system?* The general answer is that most of these devices do not. All of the cheaper controls are of the intermittent, full-on, full-off type. They measure the weather and determine for what portion of the cycle heat should be on. Their use assumes rapid and uniform response of the heating system, a condition that generally holds true for central plant steam systems, often is quite satisfactory for oil fired systems and is much less to be expected in stoker fired plants. However, many of these ingenious instruments, even the cheaper ones, have means for delaying the start of the measured "on" cycle until the boiler or furnace responds. Devices of the modulating type designed to control larger zones are naturally more expensive. They do measure response in that they keep calling for heat until the desired steam pressure or differential pressure is attained.

4. *Does the device cycle often enough?* The length of the cycle in several instruments can be varied from fifteen minutes to one hour. It should vary with the heat storage of the system. Copper convectors should get a shot of steam about every fifteen minutes if any heat at all is needed. In my opinion, cast-iron radiators should be fed every fifteen or thirty minutes; hourly cycles are too long and may result in noticeable changes in room temperature. Hot water systems will level out cycles as long as an hour.

5. *Does it measure wind and solar radiation or merely outdoor temperature?* Obviously the measuring element must be warmer than the surrounding air if it is to measure heat losses which vary with wind. One well known control keeps its outdoor element at building temperature by heating it electrically at a rate that simulates the output of the heating system. Solar radiation is generally ignored; in fact, the measuring device is shielded. This is necessary because a measuring device of small mass would pick up radiant heat faster than would the interior of the building it controls.

The outside measuring element is generally mounted directly on the building wall. Winds scour off warm air that usually clings to the surface of the building. As a result, the temperature of the bulb is lower and the building gets more heat.

In my opinion, this question is not very important.

6. *Does it allow night shutdown and controlled morning warm-up?* This question may arouse a storm of argument. It does not always pay to reduce temperature at night. Increased maximum demand charges for purchased steam may offset savings; building heating systems may lack capacity for morning warm-up; central plants may not have capacity for the temporary warm-up load. Under these conditions night shutdown in extremely cold weather does not pay.

But with the exception of these cases that are clearly impractical, most of us agree that reduced temperatures at night make considerable savings. In residence halls, when all the windows are open all night, the savings are startling.

The point is that if night or week end shutdowns are wanted the mechanism for doing what we want should be built into the control instrument. A home-made arrangement of time switches and warm-up thermostats may cost more than the basic control costs.

CONSTRUCTION OF EQUIPMENT

The panel that contains the contacts and the adjustable dials on most of these control systems is mounted inside the building with only the temperature sensing bulb outdoors. Obviously there must be a connection between the two parts of the control. If the connection is a capillary tube, it is always sealed at the factory and cannot be disconnected for convenience in installation. The fixed length of tube limits choice of location for

SCORE SHEET FOR COMMON OUTDOOR CONTROLS

Characteristics	1	2	3	4	5
Sufficient range	Yes	No	Yes	Yes	Yes
Adjustments good for different weathers	Yes	No	Yes	Yes	Yes
Measure response	No	No	No	No	No
Cycle often enough	Yes	Yes	Yes	Yes	No
Measure wind, sun	Yes	..... well enough			
Control morning warm-up	Yes	No	Yes	Yes	Yes

indoor panel and outdoor bulb. The connecting tubing, even though armored, is fragile and must not be kinked.

Other manufacturers' instruments measure temperatures electrically. The outdoor bulb in this case is a resistance thermometer. Connections are by wires, the length of which is immaterial. Some of the electric devices use electronic tubes to actuate the control contacts. The purchaser should be sure that tubes have long life and are of a type which is easily purchased and which does not require matching. He should also be sure that the change of resistance caused by dampness of wires in conduits does not change the calibration of the instrument. Any student with experience in simple electronics can advise a purchasing agent on this point.

Nearly all of these controls determine the length of cycle, which may be variable, with a small electric clock. These clock motors should have enough power to drive an unoiled mechanism and should be of a type that can be purchased readily for replacement.

Some cheap simple mechanical devices operate more satisfactorily than costly electronic systems. The cheapest device on the market mounts the entire works in a small case outdoors. It works.

The accompanying score sheet covers the five commonest outdoor controls. They are arranged in order of decreasing cost, No. 1 being the most expensive, No. 5, the cheapest. Here "Yes" is good, "No" is bad.

Georgia Tech can now compare

RADIANT AND CONVECTOR HEATING

STEVENS and WILKINSON
Architectural Engineers, Atlanta, Ga.

ARCHITECTS AND ENGINEERS WILL have an opportunity to study the differences between radiant and convection heating systems in an eight story student apartment building now under construction at Georgia School of Technology.

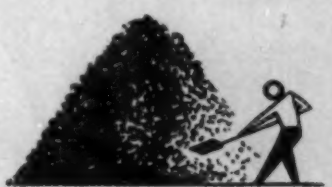
The structure is in the form of the letter "H." One wing will be heated by means of wrought iron pipe coils concealed in the concrete floor slabs and the other wing by the conventional type of convectors.

While there are some multistory buildings now using radiant heating systems in this country, this is reported to be the first to incorporate both radiant and convector types. The architectural and engineering departments at Georgia Tech plan to record operation costs as well as performance data of the two systems.

Of reinforced concrete construction, the building contains 63,000 square feet of floor space. The radiant heating pipe, fabricated in the form of sinuous coils, is embedded in the concrete structural floor of each story, each room having a separate coil equipped with a balancing valve. About 83 tons of wrought iron pipe have been used for the radiant heating coils and for the hot water supply and return mains and runouts in the convector heating system.

Basically, the only physical difference between radiant and conventional hot water heating systems is the size of the heating elements; in radiant heating the entire floor becomes a large low temperature heating panel, while in other hot water systems small high temperature elements are used. An unusual feature in the use of radiant heating for multistory buildings is the introduction of slightly different mechanical problems in the overall hydraulic system.

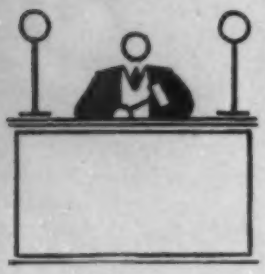
Radiant heating systems have been used in England and Europe with considerable success for many years in buildings as high as 18 stories and having large floor areas. In this country the use of radiant heating has largely been confined to one and two story buildings. This may be attributed in part to wartime regulations limiting the amount of multistory construction in the United States during the period when radiant heating was growing in popularity.



Construction is identical for the areas in which the two types of systems will be used. The only factor that may have some bearing on performance characteristics is exposure. The radiant heated wing faces south and the conventionally heated wing is exposed to the opposite direction. Heat losses for the entire structure were calculated at 1,500,000 Btu. Minimum outdoor design temperature is 10° F.

Hot water for both the radiant and convector systems is provided by means of two converters, one for each system, on the school's central steam supply lines. The converter for the radiant heating system is set at 120° to 140° and the converter for the convector lines at 180° to 200°. Both converters are 5000 G.P.Hr. Steam pressure is 25 pounds. Separate outdoor thermostatic arrangements of the anticipating type are used to control each system.

SOME TAX CASES OF 1947



M. M. CHAMBERS
American Council on Education

CURRENT DEVELOPMENTS REGARDING state tax exemption of private educational institutions are illustrated by four 1947 cases from as many states.

A building owned by a Roman Catholic order, located adjacent to a Catholic church and a parochial school and used principally as a school and residence for young missionary priests, is held taxable by the Ohio board of tax appeals.[1]

The ruling is consistent with a 1945 decision of the Ohio supreme court in a similar case involving an orthodox Jewish theological seminary, wherein the court said: "A school organized and operated by a religious denomination for the sole purpose of training men to assume ministerial positions in such church, which provides no educational opportunities to the public generally, is essentially a private institution. A building housing such school is not exempt from taxation. . . ."[2] The wording of the Ohio statute exempts "public colleges or academies or public institutions of learning not used with a view to profit."

A proprietary school for girls in New Jersey was operated by private proprietors from 1906 to 1941, when it was incorporated as a nonprofit institution. At first the corporation leased the plant from the proprietors, but in 1943 it purchased the plant for $50,000, chiefly on credit, and agreed to pay 5 per cent interest on the loan. In that year there was a net excess of some $2800 of income over expenditures. It appeared that there had been no fund-raising activities for the purpose of purchasing the school or enlarging it, but that the transfer to the corporation was initiated solely by the private proprietors. Under these circumstances the property was ordered restored to the tax rolls for the years 1944, 1945 and 1946.[3]

New Jersey has had several such cases, involving the transition from proprietary to charitable status, in recent years. The courts are inclined to scrutinize the circumstances closely and to withhold tax exemption until the possibility of substantial gain to private proprietors as a consequence of the transaction disappears.

ESTATE AND INHERITANCE TAXES

The headmaster emeritus of Hotchkiss School at Lakeville, Conn., bequeathed his residuary estate in trust for his sister for life and then to the school. The value of the school's interest could be actuarially computed as some $64,000, but whether this amount should be deductible from the estate as exempt from the New York State estate tax (the donor being a resident of New York at the time of his death) was rendered somewhat uncertain by the following clause in the will:

"Should the future welfare of my sister . . . require help in excess of the income available, I expressly authorize my trustees in their discretion to use a portion of the principal for such beneficiary."

This question has often been in the federal courts because it frequently arises under the federal tax act; there are two opposing lines of federal decisions regarding it.

One holds that deduction of the charitable remainder is proper if the circumstances indicate that it is extremely unlikely that its value will ever be reduced to provide for the needs of the private life beneficiary. The other holds that the mere possibility defeats the deduction. In the present case, the surrogate decided that, since the "welfare" of the donor's sister could be regarded as a matter of measurable material things as distinguished from a mere state of mind, deduction of the charitable remainder would be possible under the law but withheld final decision pending receipt of evidence as to the financial resources of the sister and other relevant facts.[4]

The Illinois inheritance tax act provides that "where the rights of beneficiaries are dependent upon contingencies" the tax shall be imposed at the highest rate possible under any of the contingencies, but if a later contingency causes the property to go to a tax exempt body, such body shall be entitled to a reassessment and refund.

Thus when a wealthy Chicagoan left half of his residuary estate to his arboretum trust, a charitable institution, for ten years, and the other half to his widow and two children with the stipulation that the entire corpus should go to these three private beneficiaries if the widow survived the ten year period, the widow's interest was worth over $3,000,000, and the inheritance tax on it was $392,000. She died within the ten year period, however, and according to the terms of the will a large part of her interest thereby passed to the arboretum trust. After the occurrence of this contingency it appeared that the inheritance tax should have been only $31,000, and accordingly the allowance of a reassessment and refund was affirmed.[5]

Observation of the flow of tax exemption cases leads to the conclusion that there is no tendency to depart from the time-honored practice of exempting bona fide nonprofit educational institutions and charitable gifts to them. There will always be cases in which the facts make the decision difficult and there will probably long be considerable diversity among the states as to the details of the statutes and the judicial precedents. However, universal is the principle of the helping hand of the state for nonprofit educational corporations.

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[1] Application of the Society of the Precious Blood, (Ohio B. T. A.), 71 N. E. 2d 278 (1947).

[2] Bloch *v.* Board of Tax Appeals, 144 Ohio St. 414, 59 N. E. 2d 145 (1945).

[3] Town of Montclair *v.* Kimberly School, (N. J. Dept. of Tax.), 51 A. 2d 228 (1947).

[4] In re Buell's Estate, (N. Y. Sur.), 66 N. Y. S. 2d 180 (1946).

[5] In re Morton's Estate, (Ill.), 72 N. E. 2d 809 (1947).

THERE ARE WAYS TO SIMPLIFY *Kitchen Work*

ORPHA MAE THOMAS
Assistant Professor of Institution Management
Teachers College, Columbia University

LET US CONSIDER A FEW OF THE newer methods of determining kitchen equipment requirements, making use of the technics developed by the motion and time study engineers. The terms they use may be new but I shall translate them into the terminology used in the institutional kitchen.

There are several ways of collecting valuable information in our existing kitchens. One method is to make process or flow charts of each of our typical products. Even though each day's menu is different the items in our food factory, for that is what a kitchen really is, can be grouped into classes according to the cooking processes involved.

For example, meats are roasted, broiled, panbroiled, fried, deep fat fried, stewed or braised. Vegetables are boiled, steamed, mashed, broiled or baked. By following typical products it is possible to find the history of each operation, the amount of space required for processing, the pieces of equipment needed and the time required for each process.

DATA ON EQUIPMENT USAGE

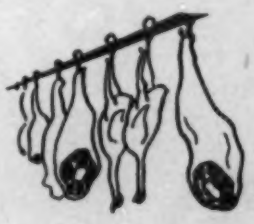
Another method of collecting data is making machine operation charts, as the industrial engineers would call them. We might call this information data on equipment usage. This can be accomplished by watching each piece of equipment for a stated period, for example, a week, during which time all the various types of food to be prepared are included. If the starting and stopping time, the name of the employe using the equipment, the product processed and the quantity of that product are recorded the result will be a case history of the usefulness of each piece of equipment studied.

Man operation charts or records of the activities of representative workers will give information on the movements of workers, why they go to certain places, what they get there and what they leave or bring back.

What is the reason for all this observation and recording? From it we are beginning to develop tables of capacities of various pieces of equipment. Another type of information useful in planning and rearranging equipment is the sequence of routings which a product follows. If we know this, we can shorten the routes used oftenest. Standard time for various jobs is another type of information that industry is collecting. We can also collect timings on repetitive operations and be better able to make effective work schedules for our employes.

The advantages of such information are obvious. In our planning we shall include the pieces of equipment actually needed and the sizes required for the amounts of production necessary in our own operation. We shall exclude pieces of equipment not actually needed. We can arrange the equipment for more effective use of labor by departments and can place some of it in areas that are accessible to several departments.

With all this we can achieve greater production with less help and less expense. Our workers will be less fatigued. And, a point that we must reckon with in these days, all this will not be resisted by organized labor. Workers will not resent having the proper equipment or having the equipment arranged conveniently.



Job training is another phase of motion economy. During the war some of the government agencies set down definite steps by which to analyze jobs. Let us review these steps and then look at some of the principles of motion economy and work simplification methods.

MOTION ECONOMY

Step 1 is to break down the job to be done. In doing this, list all details of the job exactly as it is now being done. Be sure details include all the items of labor, foods, tools and equipment. Get a clear picture of the work.

Step 2 is to question every detail of the job as it is done. Why is it necessary to do this job? What is its purpose? Where should it be done? When should it be done?

In answering these, consider the question of the hand and body motions involved, the suitability of the equipment, the arrangements of the work place, the location of the materials or food ingredients to be used and the safety and comfort of the employes.

Step 3 is to develop the new method. This step can be taken with the cooperation of others. Some industries put up suggestion boxes, sometimes paying for ideas on ways of accomplishing more work. Let us look first at the question of why this job is necessary. Perhaps the complete job could be eliminated or details of the job could be eliminated.

Rearrangement of the equipment will eliminate some steps. At Teachers College, Columbia University, we have been transporting our dishes to the basement for washing and then elevating them to the service room. By bringing the dishwashing room to the main floor, we believe that we can

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From a paper presented at a meeting of the Greater New York Dietetic Association.

eliminate at least three employes, thereby saving about $100 a week.

COMBINE ALL DETAILS

Whenever it is practical, all details of the job to be done should be combined. If onions are to be chopped and cooked, for example, the peeling process is simplified if they are placed in hot water for five minutes before peeling. There will be less weeping over the job. When it comes to the actual peeling, it is easier to cut the bottom off the onions and then cut the onions in quarters before peeling them. The outer layers almost fall off after the bottoms are removed.

Husking corn on the cob is another good example. Most people husk the corn, pulling down a few of the husks at a time and then breaking them loose at the bottom or else breaking off the entire husk along the stem at the bottom of the husk. Let us consider doing it another way. Cut the bottoms of the ears with a heavy knife, making the cut against a hard surface and cutting it at about the last row of grains on the cob. Now the husks are loose at the bottom and their removal is a much simpler job. You might call this rearranging the work in a better sequence or rearranging the order of the steps to be done. It also involves simplifying the necessary details.

The industrial engineers have made detailed studies of all the motions involved in doing work and have developed a number of principles to assist in making the job simpler. Let us look at some of these principles and their application to our kitchen work.

Transporting empty is the motion of some means of transportation without a load. It may be a hand, the two hands, the entire worker or some mechanical means of carrying. The hand reaches for a knife, the two arms reach for a mixer bowl, the cook goes for a stock pot or an empty truck is taken to the refrigerator.

How can we effect economies in this process? Can the distance be reduced? Are there barriers that could be removed to make such transport empty follow a better path? Since workers see better within a 60° angle of vision, could the reach be confined within that area? Can it be arranged to have the material come to the worker instead of having him go for it? Or perhaps could an employe who receives a lower wage bring it? Transports on a horizontal plane are more easily accomplished than are those on a vertical plane. Can these transports be horizontal? Can this transport empty to get one object be combined with one which entails getting rid of some other object?

Grasping is the motion of getting an object under control. This control may be accomplished in a variety of ways. The grasping tools may be fingers, tongs, arms, body or machines. Is the tool used for grasping the proper shape to grasp the object, as tongs for a muffin? Can one gather the proper amount with one grasp or with one load? Is the ladle or scoop the correct size for the size of the portion? Does the tool truly get the object under control, or can it slide off or loosen? Does the location in the serving pan help to facilitate this grasp?

Transporting loaded is the carrying of an object or load from one place to

another. The pencil is carried to the paper. The ladle of soup is carried to the bowl. The tray of dishes is taken from the clean dish table to storage. Let us apply motion economy here. Can the distance be reduced? Can trucks, trays or conveyors be used? Can this be made a multiple handling, taking several or a great number at one time? Is all the movement in one direction, always toward the point of service? Or is there backtracking? Can the material be moved on one plane? In the simpler jobs at one location, can the materials and equipment be arranged to eliminate passing material from one hand to the other? Would a tool assist in the transport, such as gloves in handling hot dishes? Both transports cost money. You are paying the employe to go empty handed as well as to return with a load. I am reminded of the drayman who rendered a bill

5 Comes
5 Goes
50c a went $5

Releasing, the opposite of grasping, means relinquishing control. Of course, this varies from dropping a small object like a pencil to dumping something like a load of coal. To economize on motion, can several items be released at one time? Could the objects be dropped rather than set aside carefully? Could the pieces be tossed like potatoes into a bucket rather than placed-released, an exceedingly controlled movement?

CURVED MOVEMENTS EASIEST

Is the release at a spot which requires no lifting as would be the case if the top of a bucket were placed below the working level when removing "eyes" from potatoes? Can the materials be dumped in one movement rather than ladled in many? Curved movements are accomplished much more readily than are abrupt changes of direction. Can trucks turn corners without stopping? Many building flaws slow down movement, and these are the fault of management.

Holding, another motion, is retaining an object while work is being performed on that object. The hand, especially the left hand, is often used for just that. This is time consuming and dangerous. The holding hand often gets hurt because the worker is conscious only of the working hand. Can dangerous holds be eliminated?

Do workers peel against a board? Can guides and stops be used to hold materials in place? Edges on shelves and trucks prevent trays from sliding off. A marine edge (a raised or rolled edge) on cooks' tables and sinks prevents spilled liquids from running onto the floor.

Prepositioning is locating the article in the approximate position for the next operation. Are all tools prepositioned near where they are used? Are pans placed by the pot washer conveniently for the cooks? Food parts could be prepositioned: for example, toast made in a broiler could be toasted in the counter pans ready to be covered with broccoli and cheese sauce.

Do lower salaried operators do all the prepositioning of materials possible? Are a large number of plates positioned on trays while the hands are clean, before the desserts are set up?

Positioning is placing an object in an exact and predetermined location. This often requires considerable adjustment as in gauging the thickness of a cut of meat. Because it is so exact, it is a time consuming motion. Could guides be used for eliminating controlled motions? Some of our guides in the kitchens are funnels, side and back stops on soiled and clean dish tables and special peelers for carrots

and other vegetables with the peeling thickness determined by the set of the blade.

MAKE SELECTION EASIER

Searching or locating objects with some uncertainty is always time consuming. The search may involve the eyes, the hands or all members of the body. *Finding* is the desired end of searching. *Selecting* is making a mental choice if several objects are found. The separation of these three movements is difficult but the combined movement involves only selection if tools and materials are conveniently located and are returned to proper positions. Different colored trays, labels or cans can be used to assist in selecting. Good lighting will assist. Indexing and arranging stocks will reduce searching time.

Assembling is the motion or several motions employed in combining several objects or parts of machinery to aid in more useful movements that follow. A mixer or slicer is assembled to use later. A food cutter or chopper is put together. The simpler this assembly, the more foolproof it can be made for the operator and the quicker it can be accomplished.

Disassembling is the opposite motion, taking machinery apart to release objects or to facilitate cleaning. We should know whether the tool is in scale with the job to be accomplished or whether we are "swatting flies with heavy machinery." Sometimes the assembly, disassembly and clean-up of a tool make it a "modern inconvenience."

Use, according to the industrial engineers, is the only element that determines productive output. The actual mixing, slicing, cooking and serving are our "use" motions. These cause a direct commodity change which enhances the value of the product. Industry has noted that less than 5 per cent of the total time spent in manufacturing a product is "use time."

Inspection, another fundamental motion, is the act of examining to see whether the object meets characteristic standards set up for it. It may employ any of the senses, as sight, smell or touch. In foods we test to determine whether they are done, later we examine for taste, appearance and temperature before the food is to be served.

When accepting food orders, we examine, weigh and count. Can inspection be reduced by weighing instead of counting if the number of portions does not depend upon units involved? Eggs can be weighed in the crate to reveal whether the count is all present and whether they are of the size ordered.

Delays are of several types. *Balance delay* is a wait for the movement of one portion of the body for another or for one machine to catch up with another. In some cases movements could be balanced by more symmetrical arrangements of the work area. Is each hand doing its share of the work, especially if hand motions are simultaneous?

Another type of delay is *avoidable delay.* Such a delay is not necessary in the process. It is illustrated by the dropped knife, the failure to order ingredients for planned foods, the deliberate waste of time in stalling and daydreaming or the using of improper tools, equipment and temperatures. Is the operator trained properly for this job? Does the supervisor establish and maintain with employes relationships conducive for working? Are hazards to safety eliminated?

Unavoidable delays are delays outside the control of the operator. The gas is turned off, a fuse burns out, a tumbler breaks in the hand, the mixer is broken. It is within our power as supervisors to reduce these delays. Are sufficient supplies on hand? Are proper tools provided and are repairs and maintenance kept up? Are the operators using the proper tools? Is the working space crowded? Is the employe working overtime when he is tired? Is the division of work among several operators according to time allotted and abilities?

Planning is a mental activity to decide the course of action. It may be consulting a recipe or work sheet. Most planning should be done by supervisors so that cooks and bakers will have little to decide, or it may be done at definite times in consultation and not require questioning regarding one point at a time.

Planned rest is designed to overcome fatigue. The amount of rest required will be reduced if other motions have been well planned. Reducing noise, providing sufficient ventilation, insisting on proper clothing, *i.e.* shoes, and selecting properly trained employes will reduce fatigue.

PUT NEW METHOD TO USE

There is one more step in the job analysis. That is to apply the new method. It will clarify the ideas on "savings" made if you write up your proposal or have your appointed supervisor do this. It will help to sell the new method to others. Explain the advantages of the new method and arrangement and how they will operate. Obtain any necessary approval so that everyone concerned will have been consulted. Check on the safety, quality and cost of each step. Get the new method into use.

Waiting kills ideas. Use the new method until a still better one is developed, but continue to look for a better way. We are expecting that some motion engineer will look at the six pallbearers at his funeral and say, "Put this thing on wheels and lay off five men." Recognize the assistance others have given you; giving credit stimulates more ideas.

Let me warn you about one item. Approach these changes with the idea of making the work easier for the employes. Never mention speed-up or reduction of labor costs. Remember it is *economy of motion and not the speed with which the elements are performed* that is the purpose of a time and motion study.

"Save the Peace"

The Food Conservation Program calls attention to the many intriguing breakfast dishes often left off menus that rival in appeal the typical American breakfast of ham and eggs or bacon and eggs. With some of these dishes, potatoes served in one form or another give the right touch for an interesting and hearty breakfast. Some of these dishes are:

BREAKFAST DISHES

Codfish cakes, catchup
Pan-fried scrapple, catsup or sirup
Creamed codfish on toast
Broiled chicken livers on toast
Kippered herring
Broiled fish (in season)
Broiled or baked kidney (beef, lamb, mutton, pork or veal)
Fried or sautéed calf's brains
Broiled canned shad roe
Fried apples and sausage
Griddle cakes (buckwheat, oatmeal, apple or banana, bread crumb or graham whole wheat)
Waffles (plain or with cheese, fruit, bran and other combinations)
Broiled crisp bacon or ham
Broiled link sausage or sausage cakes

QUESTIONS AND ANSWERS

Purchase of Adjacent Property

Question: Are colleges justified in buying land and houses adjacent to campus in view of antagonism from local taxpayers?—A.J.C., N. Y.

ANSWER: Such purchases would appear to be justified if they are made to meet the educational needs of the institution. In those states in which college owned real estate is tax exempt regardless of the use to which it is put, the demands of the public interest should be given sympathetic consideration.—RALPH J. WATTS, *business manager, Lawrence College.*

Faculty on Budget Committee?

Question: Among liberal arts colleges with enrollments of less than 1500, is it common practice to have a faculty budget committee on which the majority (if not all) are members of the teaching staff? If so, is this committee given detailed information on the entire college budget or on the entire budget except salaries or on the budget exclusive of salaries and auxiliary enterprises, or only on departmental appropriations? Does this committee have any authority in determining appropriations aside from the allocation, as between departments, of the amount set aside by the president and/or trustees for departmental appropriations? If so, to what extent?—A.J.J., Ohio.

ANSWER: It is not common practice among small colleges to refer budget matters to a faculty budget committee. In fact, it seems to me neither desirable nor appropriate for the administrative and financial aspects of budget-making to be delegated to members of the teaching staff for the following reasons:

1. Teaching is a full time occupation and those who are engaged in it should not be diverted from their primary task of instruction.

2. Administrative personnel is selected and employed by the board of trustees to function as administrators. Most aspects of budget-making are administrative, not instructional; hence they should not be transferred to teachers. If administrators are not competent they should be replaced.

3. If members of teaching staffs are consulted on financial decisions affecting their own interests, it may be assumed that those decisions will involve compromise and create discontent.

The point of view of members of the teaching staff should be obtained on overall academic policy as well as on the budgeting of funds for their own departments. It would seem unwise to present to a faculty budget committee information on the entire college budget or any part of it, except as noted above, or to expect effective administration should this be done.

In case of a particular small liberal arts college, practice will have to be governed by established provisions in charters, by-laws and, to some extent at least, by traditional procedures.—BOARDMAN BUMP, *treasurer and comptroller, Mount Holyoke College.*

Reconditioning Oiled Floors

Question: How can old oil-soaked classroom floors be properly reconditioned?—B.E.F., N. J.

ANSWER: Old oiled-soaked floors can be justly criticized. To remove the oil and to provide a smooth surface require a good sanding job. And a good sanding job that does not show sandpaper marks when the seal coat is applied requires the use of 00 sandpaper for the final cut.

After the sanded floor has been vacuumed, apply a good grade of penetrating sealer. Several products on the market have been especially prepared for this purpose, or any reputable paint and varnish manufacturer will, upon request, furnish a good grade of floor varnish which, when properly thinned, will give a satisfactory finish. For thinning, use mineral spirits, which is cheaper than turpentine and just as good. To find how much to thin, ask the manufacturer.

The varnish sealer may be applied with brush or mop. The excess should be wiped off and, when dry, the surface should be steel-wooled and then cleaned with a vacuum cleaner. A second coat should be applied, steel-wooled and vacuumed; if the floors are pine, a third coat may be needed to bind the surface fibers of the wood. The idea is to seal the surface to prevent ingress of dirt and to provide a smooth surface to clean but not to put on a heavy surface film which will wear through and cannot be patched. The final finish should be a good grade of wax in any of the forms of paste, spirit dispersed or water emulsion. Paste wax gives a more lasting and beautiful finish but takes more work.

Worn spots in this finish can be patched with the same sealer, first steel-wooling the surface, and following the original procedure for sealing. Removal of all the wax is not necessary; if, because of wax left on the surface, the sealer does not penetrate some spots, they probably do not need refinishing.—O. L. ADAMS, *real estate department, Northwestern University.*

In Classifying Personnel

Question: In the experience of colleges and universities that have set up classification of nonacademic personnel, what is the approximate percentage increase in total pay roll? This question is prompted by the assumption that the pay roll will increase with the installation of a classification system. We are interested in getting the experience of an institution with student enrollment of approximately 10,000.—P.W.H., Utah.

ANSWER: The assumption that the pay roll will increase with the installation of the classification system is not necessarily correct. A classification system can be set up without any change being made in individual salaries because such a system is simply the grouping within salary ranges of the highest paid down to the lowest paid individuals.

After this process is completed, the question arises as to whether any persons are underpaid or overpaid. This can be determined only by a job analysis and evaluation. There is even the possibility that the installation of the classification system might decrease the pay roll rather than increase it, although this is a remote probability during current times.

The real factor affecting pay roll is not the installation of a classification system, but the pressure for general increases to offset the increased cost of living. The COLLEGE and UNIVERSITY BUSINESS survey of last spring showed an average increase of 14 per cent since January 1946 and of 22 per cent since January 1945. These are the factors that effect increases in pay rolls, not the installation of a classification system.—ROBERT F. MOORE, *director of personnel, Columbia University.*

THE ROVING REPORTER

Bargains for Dames

Student wives at Ohio State University have landed the first punch in the opening round of the battle against high prices, a cooperative bargain exchange bulletin titled the *Dollar-Stretcher.* It lists the cheapest buys in town in half a dozen family necessities including food, clothing and children's wear.

The bulletin is put out by the Ohio State chapter of University Dames, a national organization of student wives and married women students, as a service to members in their struggle to stretch the $90 government checks.

The first issue, listing more than two dozen bargains discovered by Dames' members in an exhaustive telephone shopping tour, covers everything from diapers to Christmas tree decorations and gives prices and names of stores.

Dames' members do the comparative shopping and the work of putting out the bulletin as a volunteer service to help one another. The bulletin is available only to members of the group at regular meetings.

They Live With Art

Students at Alfred University, Alfred, N. Y., have the privilege of decorating their residence hall rooms with masterpieces of art on the basis of a rental arrangement of less than 1 cent a day. Fifty-four reproductions of paintings by Rembrandt, Van Gogh, Gainsborough, Grant Wood and other artists are available for distribution to students.

Valued at $700, the reproductions are being made available at the rate of 50 cents and $1 for the 120 day semester. Freshmen are given first choice, and then upper classmen and faculty make selections on a "first-come, first-served" basis. Income from the rental fees is used by the university to purchase additional prints for the collection.

The reproductions were given to the university last spring and were first exhibited during a fine arts festival. Since that time they have hung in the Campus Union, where a student newspaper poll determined as "most popular" Frederick J. Waugh's "Windward Shore," a painting of a rocky New England coast swept by surf.

Offers Annuities to Investors

"A New Plan for Lifetime Security" is the title of a booklet recently released by Pomona College for the purpose of interesting investors in the program of the college. According to the investment program announcement, for more than forty years Pomona College has received funds on which it has paid lifelong income to a group of careful investors.

When a person invests funds with Pomona College he is afforded the choice of two plans that will pay a secured income for life to the investor. One is the fixed annuity and the other a life income. This is the way in which the fixed annuity program might work:

Mrs. A., a widow, age 64, invests $10,000 with Pomona College for an annuity under Plan I. The annual payment is a guaranteed sum of $500 each year for life. Payments are made on either a quarterly or semiannual basis depending on her choice. When Mrs. A. purchases this annuity, she has the privilege of instructing the college how this fund will be used upon her demise and in whose honor it will be named.

Accordingly, she names the fund in the memory of her husband; to insure perpetuity to the fund she instructs the college to keep the remaining principal intact and to spend only the interest; last, she requests that the annual income be used for purposes of instruction.

Under present federal tax regulations her acquisition of this annuity is regarded as part purchase and part gift. At her age the gift portion amounts to $2200, which she can deduct from her income tax, subject of course to the 15 per cent limitation. In addition, part of the annual income of $500 is exempt from taxes. Mrs. A. pays income tax on $234; the remainder, $266, is tax free until the full cost of the annuity portion of the original purchase has been recovered.

The life income contract offered investors by Pomona College differs slightly from the guaranteed annuity, in that the income from the life income contract fluctuates from year to year. This is true because the net return from college investments is not constant. The investor still controls designation of the residual fund and its use by the college; this fund becomes the sole property of the college upon the investor's death.

Copies of the investment program booklet of Pomona College may be obtained without charge by writing to the president, Pomona College, Claremont, Calif.

Men in Uniform

Better personnel relations are being stimulated by Don L. Rogers, superintendent of buildings and grounds at the Medical College of Virginia, through outfitting members of his staff in uniforms. He has discovered that a uniform adds considerable prestige both in the eyes of the personnel itself and in the attitude of other departments.

The uniforms carry over the left breast pocket the designation "Medical College of Virginia" and over the right pocket the classification of work, such as carpenter or plumber. A considerable improvement in efficiency has been noted since the acquisition of uniforms. More than 100 employes are outfitted and, according to available records, they answer a service call every eight minutes of the day, which means that the uniforms are much in evidence.

Profits from soft drink dispensers enables the building and grounds department to buy one uniform for each one the employe buys. Mr. Rogers declares that uniforms are a genuine aid in stabilizing department personnel.

NEWS

Congress Probes College Income . . . Regional Negro Colleges Sought by South . . . P.H.A. Revises Policy on Maintenance Charges . . . V.A. Payments to Colleges Studied . . . Segregation Blasted by President's Civil Rights Committee

Washington Correspondent: HELEN C. BROWN

Congress Seeks Data on Income Producing Activities of Colleges

WASHINGTON, D. C.—The special committee of the House ways and means committee appointed to investigate sources of internal revenue has asked the American Council on Education to submit data on noneducational income producing activities conducted by colleges and universities.

These activities, called to the attention of the committee through a report submitted by the National Association of Commercial Laboratories, include contract research and the operation of commercial enterprises. A number of institutions of higher education have included in their contracts for research both with governmental agencies and with industrial organizations a considerable margin above the cost of conducting such research. Several institutions have purchased outright or have acquired a controlling interest in business enterprises, such as a chain of retail stores or a macaroni manufacturing concern.

The extension of the fiscal policies of colleges and universities into the commercial field is a sincere effort on the part of the institutions to meet the rapidly mounting cost of education without further increase in tuition and other fees. But by removing the income from such enterprises from federal corporation taxes, such extension has raised the whole issue of the kinds of activities in which educational institutions may engage without violation of Section 101 of the Internal Revenue Code which exempts them from such tax.

Hearings concern all religious, charitable and educational organizations, labor unions and other organizations operating on such a basis that no profit accrues to the organization or to any individual in the corporation.

Ask Congressional O.K. of Regional Negro Colleges

ASHEVILLE, N. C.—A recent session of the Southern Governors Conference concluded with the adoption of a resolution urgently requesting Congress to approve legislation authorizing state compacts for establishing cooperative ownership and operation of regional schools for certain forms of higher education.

This action was taken as a new step in the controversial problem of providing professional, technical and graduate training for white and Negro students in the South.

After a two day discussion of the problem, the governors agreed that regional institutions were necessary for certain types of higher education in the South because the number of students desiring such training was limited and individual states were unable to finance such facilities within their borders.

The governors discussed the question as to whether establishment of a regional school for Negroes as a possible solution to the racial educational problem in the South might not meet the constitutional requirements handed down in recent decisions of the U. S. Supreme Court. As a result, the governors adopted a resolution declaring the need for regional schools affected both white and Negro students.

Volume Index

If you bind your copies of COLLEGE AND UNIVERSITY BUSINESS, you will want the index to Volume 3, covering issues from July through December 1947. Write the publisher or use the tear-out postal card opposite page 41. Address: 919 North Michigan Avenue, Chicago 11, Ill.

P.H.A. Revises Charges Permitted for Repairs on Project Dwellings

WASHINGTON, D. C.—Educational institutions and other agencies operating housing erected under the Lanham Act will now be permitted to charge, as project expenses, surcharges to tenants for excess utility consumption and damages to property not to exceed the cost of repair.

The new regulation, issued by the Public Housing Agency, provides new alternate plans to cover such charges which the operating agency may elect as an amendment to any existing contract providing for the payment of net income annually to P.H.A.

The first alternate plan provides that the local body may accumulate a reserve for repair, maintenance and replacements by withholding from available project income at the end of each fiscal year an amount equal to the difference between the average annual estimate for RM&R and the actual expense of RM&R incurred during the fiscal year. Such reserves may be made retroactive to the date of commencement of charges to project revenue, provided, however, that if the local body has made a settlement for the period ending June 30, 1946, no adjustment will be made by P.H.A.

This reserve will be retained in the custody of the local body throughout the useful life of the project and shall be available to meet RM&R expense in any fiscal year during which the actual expense properly incurred for such items exceeds the amount available.

The second alternate plan provides that the local body may charge as expense and pay from income a fixed amount per month for operating each dwelling in the project. This amount shall be the estimated allowable operating cost per unit per month and shall be established in the project manage-

ment plan. This amount shall include all items of expense (including ground rentals) allowable under the earlier plans of operation, except payments in lieu of taxes and furniture allowance.

When actual allowable operating costs are less than the fixed operating cost for any fiscal year, the local body must set aside the amount of such differences as a reserve for deficits. Such reserve shall be retained by the local body to meet any deficits in operation or management. Under termination of the project and final settlement with P.H.A., all unexpended and uncommitted sums in such reserve shall be retained by the local body.

Huge Backlog of Veterans for Colleges

WASHINGTON, D. C.—By November 30, only 78,000 veterans had completed their time-entitlement for education and training under Public Law 346 or had been declared rehabilitated under Public Law 16.

This number represents only about 1 per cent of the total number of veterans who have taken out their certificates of eligibility and entitlement and but 4 per cent of those who have discontinued their education.

It is impossible to predict how many of the 2,000,000 veterans who have dropped out of education but are eligible to re-enroll may choose to do so. Changes in the economic picture or increase in subsistence payments will influence their decision. Having entered into training they have nine years from July 30, 1947, in which they may re-enroll to complete their time-entitlement.

Approximately 1,350,000 men volunteered for military service during the year Oct. 6, 1945, to Oct. 5, 1946, in which the Voluntary Enlistment Act was in effect. This act provided that all enlistees would continue to accumulate time-entitlement for the entire period of their enlistment regardless of any declaration of the termination of hostilities, up to the maximum of four calendar years.

Since these enlistments were for a minimum of two years, only a small proportion of this group has been discharged. These men will have four years from the date of their discharge to elect to enter into training and nine years in which to complete such education and training.

Negro Colleges Lead in Enrollment Increase

WASHINGTON, D. C.—The increase in college enrollment predicted for this fall has materialized, according to a report released by the U. S. Office of Education in November. A survey was made through a postcard questionnaire on which the 1778 institutions of higher education indicated their enrollment for the first term of this college year.

A total of 2,300,000 students is in attendance, an increase of 10.7 per cent over the first term last year. Enrollment in universities, colleges and professional schools increased 9.6 per cent and in junior colleges, 13.8 per cent. The largest percentage of increase was in colleges and universities for Negroes which this fall have an enrollment of 73,900, or 25.6 per cent more than a year ago.

Six universities enroll 194,000 students, or more than 8 per cent of the total. They range from New York University with 46,312 to Northwestern University with 24,254.

Special Session May Consider These Bills

WASHINGTON, D. C.—The two bills, aside from foreign relief and price control, most likely to be acted upon early in the special session of Congress are: tax reduction, twice vetoed by the President, and the increase in subsistence to full time veteran students, passed by the Senate and on the calendar of the House after being favorably reported out of committee.

The Department of the Army will press for universal military training but it is generally believed to be "too hot" an issue for an election year, especially since it involves a minimum cash expenditure of $2,000,000,000 a year. If the world situation grows tenser and if there are "border incidents" or a "walk-out" from the U.N., then quick action may be expected. The bill is already on the calendar of the House but short hearings will undoubtedly be held by the Senate committee on military affairs.

A bill that will affect a large number of persons at relatively little cost to the federal government is that to amend the Social Security Act, especially the old-age and survivors' insurance provisions (S. 1679 and H.R. 4303). The special council appointed to study this issue will issue its report as soon as possible and a technical staff has been assembling data for several months.

The two amendments which will probably be proposed are to expand the coverage of the act to include educational, religious and charitable institutions and to increase the monthly payments which were established on the 1939 price level.

Deduct From Job Relief V.A. Overpayments

WASHINGTON, D. C.—The Veterans Administration recently announced that former G.I. students who decline to pay back overpayments they received from the government while they were attending school will have the amounts they owe deducted from any unemployment allowances they may apply for.

According to V.A. officials, overpayment resulted, to a large extent, from student or college delay in reporting when training or enrollment had been interrupted or terminated. It was estimated that 500,000 veterans had been overpaid a total of $50,000,000 but that repayments were coming in at the rate of $5,000,000 a month. The V.A. had stated previously that veterans who have not made good on overpayments will not be permitted to re-enter schools or job training programs under provisions of the G.I. bill.

Explaining that federal statutes prohibit payment of government funds to persons indebted to the United States, the V.A. said instruction would be issued to state unemployment compensation agencies for the recovery of such overpayments from readjustment allowance claimants.

Gets Liberal Arts Building

STEUBENVILLE, OHIO.—Through negotiations with the Federal Works Agency the College of Steubenville has recently acquired a building for its liberal arts program which formerly was a laboratory for radar experimentation at Wright Field near Dayton. The new structure is a two story building, 27 by 97 feet. It contains five offices, four classrooms and one large assembly room. This room will be used for college assemblies, practice sessions of the orchestra and for informal dances.

NEWS

How Veterans' Housing Is Assigned at S.C.W.

PULLMAN, WASH.—The State College of Washington has evolved a priority point system that is employed in assigning housing to married veterans, according to college officials.

Priority for housing is given on the following basis: residents of Washington and of Alaska, 5 points; for each child or child expected within six months, points; students who have a "C" average, 2 points for each year of college; for each half year of war service, 1 point; to wives of veterans who are themselves veterans, 1 point.

Disabled veterans are credited with 1 point for each 10 per cent physical disability pension payment; wives of veterans who are themselves disabled veterans get similar credit. One point is allowed for each six months the applicant has been on the college housing list. Preference is given to older students. A student-faculty committee reviews all applications.

New York State Colleges Report All-Time High

ALBANY, N. Y.—Registration figures released by the New York State Education Department's division of higher education reveal that an all-time high of 309,643 students are enrolled in New York State colleges and universities.

Full time programs in the colleges are being carried by 201,028 students as compared with a total of 180,811 last year and a prewar total of about 102,000.

Dr. John S. Allen, director of the division of higher education, states that while the veterans were taking advantage of federal and state financial assistance to go to college they were not alone in their desire to continue their education.

"Before the war," he said, "there were 102,000 civilians in college full time, and this year they total 109,049, and most of this group are in college without state or federal financial aid."

V.A. Payments to Colleges Studied by American Council

WASHINGTON, D. C.—In order to determine the extent to which the Veterans Administration is in arrears in payments to institutions for the instruction of veterans, the American Council on Education submitted a questionnaire to 47 colleges and universities distributed as to type and geographic area.

Replies were received from 46 institutions. Although the total amount in arrears, not including the fall semester 1947, was approximately $8,000,000, this amount represented only 11 per cent of the total billing to the V.A. and 5 per cent of the total operating budget of the institutions.

The distribution of the amount in arrears is as follows: summer term, 1947, $2,731,000; spring quarter or semester, 1946-47, $3,747,000; winter quarter, 1946-47, $1,019,000; fall quarter or semester, 1946-47, $379,000; summer term, 1946, $59,000, and prior to summer, 1946, $115,000.

A number of the institutions stated that their payments were in arrears because of their own delay in submitting vouchers. Only 10 believed that the shortage of V.A. personnel in handling payments was a contributing factor to the delay. The majority of the institutions replied that their fiscal relationships with the V.A. were entirely satisfactory.

In discussing these findings at the November 22 meeting of the A.C.E. committee on the relationships of higher education to the federal government with V.A. representatives, it was apparent that institutions could help meet the problem by prompt submission of their vouchers and by adopting, if they have not already done so, the 75 per cent advance payment method. Institutions seriously in arrears are urged to take up the matter with the V.A. regional offices.

Strong Recommendations in Civil Rights Report

WASHINGTON, D. C.—States and local communities should be denied federal grants for education, public housing and similar projects if they use such money to support or perpetuate a pattern of segregation. This was one of the forceful recommendations of the report of the President's committee on civil rights.

The committee cited the District of Columbia as illustrative of the inequality of opportunities for education, recreation, health and hospitalization and even penal care when segregation is practiced. Stating that conditions in the District of Columbia "eloquently document the extent to which even reasonable equality is impossible in a segregated school system," the committee asks Congress to withhold funds unless segregation is abolished.

As a national program, the committee recommended that federal and state laws be modified or enacted to guarantee the four essential rights of safety and security of the person, of citizenship and its privileges, of freedom of conscience and expression, and of equality of opportunity.

Concerning the right to equality of opportunity, the following actions are proposed: elimination of segregation based on race, creed or national origin; the granting of federal funds only if there is neither segregation nor discrimination in the use of the funds; enactment of federal and state fair employment laws; legislation banning discrimination in schools, preventing restrictive covenants among property owners and outlawing segregation in public or private health facilities and guaranteeing equal access to hotels and theaters; legislation, both federal and state, declaring that discrimination or segregation in the rendering of all public service is contrary to public policy; prohibition by law of segregation or discrimination in all inter-state transportation, and federal legislation to end segregation in the District of Columbia and the Panama Canal Zone.

Other major recommendations include: a federal anti-lynching law; barring all racial discrimination and segregation in the armed services; giving full right of self government and congressional representation to the District of Columbia and the right to vote to Indians now barred from exercising this right, and action by the Congress or the state to end the poll tax.

Testing Center Directory

WASHINGTON, D. C.—The American Council on Education's Veterans' Testing Service has issued a new directory of testing service representatives in state departments of education and the individuals in more than 500 schools, colleges and universities who are authorized to give General Educational Development tests to veterans.

Asks Colleges to Teach Government Scientists

WASHINGTON, D. C.—Colleges and universities should provide evening courses in scientific subjects specifically adapted to the needs of government employes engaged in governmental research, according to a report prepared by the interdepartmental advisory committee on scientific personnel for the President's Scientific Research Board.

When the training is essential to the successful promotion of the research, arrangements should be made to provide courses on employed time. Closer cooperation should also be established between the institution and the laboratory in utilizing the research for doctorate dissertations.

The report further emphasizes the responsibility of government in assuring a wise and equitable distribution of research as between the governmental laboratories, universities, private research laboratories and industrial laboratories. The government has a responsibility also in keeping a balance between basic and applied research.

Reports on Education

WASHINGTON, D. C.—Activities of the U. S. Chamber of Commerce in the advancement of education are summarized in the November 15 publication of *News and Cues*. The report includes a résumé of the action taken by more than 400 local chambers of commerce.

Virginia President Urges Two Year Colleges

CHARLOTTESVILLE, VA.—Under the leadership of newly appointed President Colgate Whitehead Darden Jr. of the University of Virginia, an extensive expansion program has been started to provide additional facilities for the university. To meet the needs of the present era, a fund raising campaign by alumni, headed by Fleet Admiral William F. Halsey, has set an objective of $7,600,000 to provide for eight projects regarded as essential.

The university is planning to expand the medical school, the graduate school of commerce and the law school. An alumni hall, to be built as a memorial to World War II veterans, is also planned.

In view of present crowded conditions on college campuses, President Darden recommends the formation of two year colleges throughout the state to meet the emergency. Penn State College has followed this program with considerable success.

In addition to the extension of junior colleges throughout the state, Mr. Darden is of the opinion that the University of Virginia must take the initiative in setting up a statewide system of adult education. He expresses concern for the educational program of the 75 per cent of high school graduates who do not go to college and believes that a statewide system of adult education will be a partial solution in meeting their needs.

Maryland Expands Plant and Colleges

COLLEGE PARK, MD.—The University of Maryland has built nearly $3,000,000 worth of new buildings at the College Park campus. These buildings include a $500,000 college of agriculture building, a $275,000 general classroom building, three residence halls for men totaling $400,000, a $375,000 annex to the campus dining hall and a $1,250,000 experimental wind tunnel.

The last structure is the first unit of the proposed Glenn L. Martin College of Engineering and Aeronautical Sciences. Plans have been completed for 15 other buildings of this new group, with construction on them expected to start some time next year.

Harvard, Radcliffe Classes to Combine

CAMBRIDGE, MASS.—The governing bodies of Harvard University and Radcliffe College have formalized the existing arrangements between the two institutions providing for joint instruction of students in all cases in which separate instruction would be a waste of faculty personnel.

Under this arrangement, most upperclass and graduate men and women will share the same instructors in lectures and in conference rooms. Since the beginning of Radcliffe College in 1879, Harvard professors have always supplied the instruction.

Residence halls directors of "Big Nine" universities discuss common problems at Indiana University November 12. Left to right: S. Earl Thompson, Illinois; John D. Gantz, Purdue men; Lowell K. Wrigley, Ohio State men; Lee Burns, Wisconsin; J. C. Schilletter, Iowa State College; Willard Buntain, Northwestern; Inez Canan, Purdue women; F. C. Shiel, Michigan; Florence Pope, Chicago; T. M. Rehder, Iowa; Alice Nelson, Indiana.

NEWS

Land-Grant Colleges in Annual Meeting

WASHINGTON, D. C.—Federal aid to public elementary and secondary education was endorsed at the annual meeting of the Association and Land-Grant Colleges and Universities held here November 10 to 12.

The resolution "endorses the principle of federal aid to publicly controlled and operated elementary and secondary schools for the purpose of equalizing educational opportunity, when such assistance is free from federal control and thus preserves a maximum of local and state autonomy. We look upon such a program as the most basic step which can be taken at this time by the federal government in behalf of education."

Although no official action was taken in regard to federal aid to higher education, there was general agreement that, if provided, it should follow the same principle.

Other actions taken by the association included: endorsement of the proposed legislation to provide federal aid in the construction of military science buildings; an increase in compensation to men in R.O.T.C. in order to make such compensation more nearly equal that given to those in N.R.O.T.C.; the development of agricultural and related educational activities on reclaimed lands by the agricultural agencies of the federal and state governments; reaffirmation of the endorsement of legislation to establish a national science foundation with provision for distribution of a portion of the research funds on a state basis.

Endorsement of the report of the President's Commission on Universal Training was referred to a special committee for further study.

Dr. J. L. Morrill, president of the University of Minnesota, was elected president of the association, and Dean Thomas Cooper of the University of Kentucky, chairman of the executive committee. Russell Thackery was re-elected executive secretary.

Fraternity Officers Assisted

ALBION, MICH.—Faculty members of Albion College recently conducted courses for officers of fraternities to assist them in their business operations. The faculty was drawn from staff members of the business administration department.

Gray Succeeds Bradley as V.A. Administrator

WASHINGTON, D. C.—The President has announced the appointment of Carl R. Gray Jr., vice president of the Chicago and Northwestern Railway, as the new administrator of the Veterans Administration to take over Gen. Bradley's job. Mr. Gray served in both World Wars; in World War II he was a major general in charge of railway transportation in Europe. A native of Kansas and a graduate of the University of Illinois, he has had a long record of successful experience in business administration. His appointment has been praised by the American Legion and other veterans' organizations.

Gen. Bradley will succeed Gen. Eisenhower as army chief of staff.

Littlejohn Resigns as Head of W.A.A.

WASHINGTON, D. C.—Gen. Robert M. Littlejohn, whose submitted resignation as director of the War Assets Administration became effective November 28, has been succeeded by Jess Larson, deputy administrator.

Unless Congress enacts legislation to extend the life of W.A.A., the agency will be liquidated on June 30. Gen. Littlejohn stated that "steps already taken to speed up surplus property disposal will make it possible for the agency to complete its work by the end of the fiscal year."

Syracuse Acquires G.E. Plant for $600,000

SYRACUSE, N. Y.—Through negotiations with the War Assets Administration, Syracuse University has acquired a substantial part of the $20,000,000 General Electric war manufacturing plant, Chancellor William P. Tolley announces. The university has paid $600,000 for the property, which is to be known as the Science and Engineering Campus.

Nine buildings were acquired by the university. One of these will be remodeled under a $500,000 federal grant and will house the college of applied science. When completed, the building will include 50 classrooms, 18 engineering and general science laboratories, 75 shops, 10 offices and a cafeteria. Several of the smaller buildings will be used for experimental purposes.

Student Exchange With China Is Established

WASHINGTON, D. C.—The State Department has announced the establishment of an educational foundation in China for the exchange of students and educators between the United States and China.

Authorized under the provisions of the Fulbright Bill passed by the 79th Congress, the foundation will have available a total of $20,000,000 in American currency derived from the sale of American surplus in China. American war veterans are given preference among the applicants for scholarships in foreign schools and colleges.

The money, which can be spent at the rate of $1,000,000 a year, can be used for financing educational activities of Americans in Chinese schools; payment of transportation, tuition, maintenance and other expenses of Chinese students attending American schools outside the continental limits of the United States and its territories; payment of transportation costs of Chinese students attending U. S. schools.

N.Y.C. Board Refuses to Ban Subversive Groups

NEW YORK—The board of higher education of the city of New York recently rejected by a 10 to 6 vote an amendment to its by-laws that would have banned subversive groups from the campuses of New York City's four municipal colleges.

A resolution was adopted by a 14 to 2 vote, however, condemning Communism. The resolution stated that the board recognized American Youth for Democracy "as a communist-front organization" and called upon the faculties of the four schools to "exercise increased vigilance in their scrutiny of the purposes and activities of all organizations."

Yeshiva to Enlarge Plant

NEW YORK.—Officials of Yeshiva University recently announced launching of a $500,000 building program which will add 25,000 square feet of additional space to present facilities. The new structures will provide for 45 classrooms, laboratories and offices. The new work is only a beginning in the university's overall expansion program estimated at $7,500,000.

FINANCIAL CAMPAIGNS

• UNIVERSITY OF NORTH DAKOTA officials announce a special campaign to raise $100,000 for the construction of a student union building.

• UNIVERSITY OF WYOMING hopes to complete within a year its campaign for $500,000 for the Wyoming War Memorial in the form of a field house and stadium.

• WESLEYAN COLLEGE, Macon, Ga., will soon begin a $2,000,000 endowment campaign in behalf of the institution, the world's oldest chartered college for women.

• BUCKNELL UNIVERSITY, Lewisburg, Pa., is campaigning for $400,000 for a new heating plant. This is the first step in its second century development program.

• BETHEL COLLEGE AND SEMINARY, St. Paul, Minn., is beginning a campaign for $250,000 which will provide for the construction of a combination chapel and administration building.

• COLORADO COLLEGE, Colorado Springs, announces the launching of a campaign for $1,500,000 for two new dormitories and faculty salary increases.

• UNIVERSITY OF NOTRE DAME officials announced the creation of a Notre Dame Foundation for the purpose of obtaining $25,000,000 to build residence halls, research laboratories, classrooms and dining halls.

• DARTMOUTH COLLEGE has opened a $4,000,000 campaign to finance the construction of the Ernest Martin Hopkins Center and the expansion of its physics laboratory.

• BROOKLYN COLLEGE announced launching of a $300,000 campaign by the B'nai B'rith Hillel Foundation for a building for student activities at Brooklyn College.

• UNIVERSITY OF CHICAGO is seeking members for an Atomic Club. The purpose is to further atomic research for industrial uses. Membership is limited to 50 industrial organizations. The fee is $50,000 per member.

• NORTHWESTERN UNIVERSITY alumni officials have added $140,100.58 to the university's funds this year. This amount represents gifts from more than 3400 alumni through the 1947 Alumni Century Fund. All gifts received up to September 1 of this year will be added to the 1947 total, according to university officials.

State Department Issues 6 Point UNESCO Program

WASHINGTON, D. C.—The United States National Commission for UNESCO, of which Milton Eisenhower is chairman, has issued its first publication, "UNESCO and You."

In it specific ways are described through which schools and colleges can help make the new organization a vital factor in maintaining world peace. First priority is given to aiding in the educational reconstruction of war-devastated countries. This can be done by: soliciting cash contributions for purposes of purchasing needed instructional materials; collecting maps, literary classics, current technical books and magazines, recent textbooks, film projectors, radios and even toys; organizing a local committee within the school, college or community to stimulate interest in collecting such materials, and familiarizing one's self with current needs and disseminating such information to students.

Other recommendations in the six point program are: making one's personal opinion felt in the school or college community, including the utilization of the local and national press and radio; arranging local exhibits and other programs to dramatize UNESCO; training the younger generation for peace; expanding adult education, especially about UNESCO, and personally promoting good will and understanding among racial and religious groups in the community.

Would Permit Civilians at Military Schools

WASHINGTON, D. C.—Congressman Andrews, on November 18, introduced H.R. 4497 which would authorize the attendance of civilians at schools conducted by the departments of the Army, Navy and Air Force and joint-service schools.

The Secretary of Defense would be given the authority to prescribe regulations which would permit civilians, including government employes, to receive traveling expenses and subsistence, or per diem in lieu of subsistence, while attending such schools.

The purpose of the proposed legislation is to provide opportunity for the training of civilians in the technical schools conducted by the armed forces. The bill was referred to the House committee on armed services.

Names in the News

James L. Madden has been named treasurer of New York University, according to an announcement by Harry Woodburn Chase, chancellor. Mr. Madden, New York attorney, since 1927 has been a vice president of the Metropolitan Life Insurance Company.

Stanley F. Bretske, vice president and comptroller of the University of Chattanooga, was recently honored when that institution named its new student dining hall Bretske Hall. He has been business manager of the university for twenty years and is a former president of the Southern Association of College and University Business Officers.

Lloyd L. Costley has been named treasurer and business manager of Blackburn University at Carlinville, Ill. He succeeds *Wesley A. Challacombe.*

Dr. Franc Lewis McCluer, former president of Westminster College, was recently installed as twelfth president of Lindenwood College, St. Charles, Mo. He obtained international publicity for Westminster College when he invited Winston Churchill and President Truman to speak at the college in 1946.

P. W. Humphreys, bursar of Russell Sage College, has been appointed to the newly created post of business manager of the college. He will continue to hold the position of bursar. *John MacCochran* has been named assistant to the bursar.

Mary Ross Flowers, formerly associated with the Veterans Administration offices in Montgomery, Ala., has been appointed director of admissions of Alfred University, Alfred, N. Y.

NEWS

James Milholland, Pittsburgh attorney, has been named acting president of Pennsylvania State College to serve until a successor to the late *Ralph D. Hetzel* can be appointed. The following members of the Penn State will assist Mr. Milholland in the administration of the institution: *S. K. Hostetter,* in charge of business and finance; *J. Orvis Keller,* in charge of extension services; *C. S. Wyand,* administrative assistant. *Adrian O. Morse* has been named as assistant to the president in charge of resident instruction; *W. E. Kenworthy,* executive secretary.

Dr. Robert B. Stewart, vice president and controller of Purdue University, is on a four months' leave of absence. Part of that time will be spent in vacationing Florida and probably Mexico or Hawaii. The remainder of the time will be spent in informal visits to various colleges and universities around the nation.

Doris L. Crockett, dean of Russell Sage College, will direct administrative affairs of the college during the leave of absence granted to *President Helen M. McKinstry* because of illness.

Dr. Wilbur W. White, dean of the graduate school of Western Reserve University since 1941, was recently named president of Toledo University, succeeding the late *Dr. Philip Nash.*

Waldo Olson, formerly a faculty member of the University of Wyoming, has been named business manager of Colorado Woman's College. He succeeds *Harold D. Fasnacht,* head of the business education department of the college, who is on sabbatical leave.

Herman B. Wells, president of Indiana University, has been granted a six months' leave of absence to serve as adviser on educational and cultural affairs to Gen. Lucius D. Clay, American Military Governor for Germany. During his absence administrative affairs of the university have been placed by the board of trustees in the hands of a committee of four consisting of John S. Hastings, member of the board; Dr. H. T. Briscoe, vice president and dean of the faculties; Dean Wendell W. Wright of the school of education, and Joseph A. Franklin, treasurer.

M. Gale Morgan, formerly purchasing agent of the Argonne National Laboratory, has been named assistant business manager of Valparaiso University. Mr. Morgan had been assistant purchasing agent of the University of Chicago prior to his appointment to the Argonne laboratory, which is being operated in cooperation with the Atomic Energy Commission.

Allan E. Kappelman, assistant to the treasurer of the University of Rochester, resigned recently to become president and treasurer of Howe Plan, Inc., investment firm of Rochester, N. Y. He will be succeeded by *Thomas E. Wood,* who had been serving as coordinator of veterans' affairs.

Edward B. Lyman, associate director of business development for the Cities Service Company, has been named assistant to the president of Fordham University, according to an announcement by *President Robert I. Gannon, S.J.* Mr. Lyman will direct Fordham's public relations activities.

Dr. Eugene C. Brooks, 75, president emeritus of North Carolina State College, died recently after an illness of several years. Dr. Brooks served as president of State College from 1923 until 1934 when it became a part of the University of North Carolina. Prior to 1923, he served for many years as the state superintendent of schools.

DIRECTORY OF ASSOCIATIONS

Associations of College and University Business Officers

Central Association

President: T. E. Blackwell, Washington University; secretary-treasurer: L. R. Lunden, University of Minnesota.

Eastern Association

President: R. C. Magrath, University of New Hampshire; secretary-treasurer: Boardman Bump, Mount Holyoke College.

Southern Association

President: George R. Kavenaugh, Berea College; secretary-treasurer: Gerald D. Henderson, Vanderbilt University.

Western Association

President: William Norton, University of California; secretary-treasurer: William Brand, Stanford University.

Convention: April 25-27, University of Washington, Seattle.

Schools for Negroes

President: V. D. Johnston, Howard University; secretary: L. H. Foster Jr., Tuskegee Institute.

Educational Buyers Association

President: Gerald D. Henderson, Vanderbilt University; executive secretary: Bert C. Ahrens, 45 Astor Place, New York, N. Y.

Convention: May 5-8, Deshler-Wallick Hotel, Columbus, Ohio.

Association of Superintendents of Buildings and Grounds of Universities and Colleges

President: Paul H. Elleman, Ohio State University; secretary-treasurer: A. F. Gallistel, University of Wisconsin.

Convention: May 1948, University of Minnesota.

Association of College Unions

President: Douglas O. Woodruff, University of Utah; secretary-treasurer: Edgar A. Whiting, Cornell University; editor: Porter Butts, University of Wisconsin.

Convention: April 29-May 1, Roanoke Hotel, Roanoke, Va.

American College Public Relations Association

President: Horace Renegar, Tulane University; secretary-treasurer: Max E. Hannum, Franklin and Marshall College.

Convention: June 23-27, Denver, E. D. Whittlesey, University of Denver, convention secretary.

National Association of College Stores

President: A. W. Littlefield, Barnes and Noble, Inc., New York, N. Y.; executive secretary: Russell Reynolds, 189 West Madison Street, Chicago.

Convention: April 19-21, Hotel Pennsylvania, New York City.

PRODUCT INFORMATION

Information on the materials, equipment and supplies with which an institution is built, operated and maintained and which are used in its various departments is of vital interest to those charged with the business operation. College and University Business recognizes the importance of this information and believes it has rendered a real service by grouping manufacturers' announcements and new product descriptions into a separate part of the magazine. We believe this is an infinitely better plan than to mix such information through the editorial pages where it becomes obscure and confusing.

You will find manufacturers' advertisements from pages 41-64. Pages 58-63 contain descriptions of new products and items of interest. Further details on any product advertised or described may be obtained without obligation and with a minimum of effort by use of the postcard below.

Index to "What's New"

Pages 58-63

Key

634 Multi-Clean Products Inc.
All-Purpose Vacuum Cleaners

635 F. W. Boltz Corp.
Premium Puddings

636 The B. F. Goodrich Co.
Koroseal Apron

637 Toastmaster Products Div.
Toastmaster Waffle Baker

638 American Abrasive Metals Co.
Amcolun Safety Tile

639 Bay West Paper Co.
Rolltowl Paper Towel Dispenser

640 Eastman Kodak Co.
Twin Speaker Unit

641 The Ace Co.
Ace Hand Trucks

642 Allied Radio Corp.
Knight Ranger Radio Builder's Kit

643 Jewett Associates
Frozen Storage Alarm

644 Detecto Scales Inc.
Detecto-Gram Speed Scale

645 Beckley-Cardy Co.
Glass-Enclosed Bulletin Board

646 Charles Beseler Co.
Beseler Vu-Graph

647 Electric Cord Co.
Hydraulic Pipe Bender

648 C. Howard Hunt Pen Co.
Boston Ranger Pencil Sharpener

Key

649 The Ebco Mfg. Co.
Bottle Water Cooler

650 Ideal Pictures Corp.
M-1 Projector Table

651 Technygraph Co.
Fluorescent Model F-2 Technyscope

652 Lee Metal Products, Inc.
Super Jacketed Kettles

653 The Audio Development Co.
Audiometer

654 Zenith Radio Corp.
Classroom Record Player

655 Amcoin Corp.
Restyled Coffee Urns

656 Radio Corporation of America
Victrola Classroom Phonograph

657 Columbia Chemical Div., Pittsburgh Plate Glass Co.
Granular Germicide, Pittcide

658 U-C-Lite Manufacturing Co.
Auxiliary Lamps for Emergency Lighting

659 Automatic Pencil Sharpener Div.
Dexter Pencil Sharpener

660 Juice Industries, Inc.
Concentrated Orange Jelly

661 Weber Costello Co.
Hyloplate Lite Site Blackboard

662 Precision Scientific Co.
Laboratory Evaporator

USE THIS CARD

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Index to "What's New" *Continued*

Key

663 Springfield Woolen Mill Co.
Nylon Warp Wool Blanket

664 American-LaFrance-Foamite Corp.
Twin Automatic Parking Meter

665 Wolber Duplicator & Supply Co.
Copy-rite Liquid Duplicator

666 Huebsch Mfg. Co.
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679 The Maple Flooring Manufacturers Assn.
Change of Address

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Change of Address

681 The Heyer Corp.
Change of Address

682 DeVry Corporation
Transfer of American Film Registry

Index to Products Advertised

Key — *Page*

683 Ampro Corporation
Movie Projector 45

684 Audio Development Company
Audiometer 52

685 Bell & Howell Company
Movie Projector 41

686 Bradley Washfountain Company
Plumbing Equipment 54

687 Carrom Industries, Inc.
Institutional Furniture 49

688 Clark Linen & Equipment Co.
Institutional Furniture 54

689 Continental Car-Na-Var Corp.
Floor Maintenance 55

690 Dick Company, A. B.
Duplicator 64

691 Dolge Company, C. B.
Athlete's Foot Preventive 52

692 Dudley Lock Corporation
Locks 48

693 Electric-Aire Engineering Corp.
Hair Dryer 48

694 Hamilton Manufacturing Co.
Laboratory Equipment 46

695 Hillyard Sales Companies
Floor Maintenance 46

Key — *Page*

696 Holt Manufacturing Co.
Floor Machine 50

697 Huntington Laboratories, Inc.
Liquid Soap 56

698 Legge Co., Inc., Walter C.
Floor Maintenance 53

699 Maas Organ Company
Cathedral Chimes 48

700 Moore, Inc., P. O.
Key Control 54

701 National Lock Company
Locks 44

702 Quaker Oats Company
Institutional Food 57

703 Remington Rand, Inc.
Fireproof Record System 51

704 Schulmerich Electronics, Inc.
Carillonic Bells 50

705 Sexton & Company, John
Institutional Food ..... *4th Cover*

706 Simmons Company
Institutional Furniture 47

707 Sloan Valve Company
Flush Valves 42

708 Spaulding-Moss Company
Graph Papers 48

709 Vestal, Inc.
Floor Maintenance 44

710 Victor Animatograph Corporation
Movie Projector ..... *3rd Cover*

711 Vogel-Peterson
Costumers and Hat Racks 52

712 Wakefield Brass Company, F. W.
School Lighting 43

December, 1947

Please ask the manufacturers, indicated by the numbers I have circled, to send further literature and information provided there is no charge or obligation.

ADVERTISEMENTS					WHAT'S NEW							
683	689	695	701	707	634	641	647	653	659	665	671	677
684	690	696	702	708	635	642	648	654	660	666	672	678
685	691	697	703	709	636	643	649	655	661	667	673	679
686	692	698	704	710	637	644	650	656	662	668	674	680
687	693	699	705	711	638	645	651	657	663	669	675	681
688	694	700	706	712	639	646	652	658	664	670	676	682
					640							

☐ Six month Volume Index, July-December 1947

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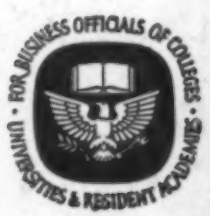

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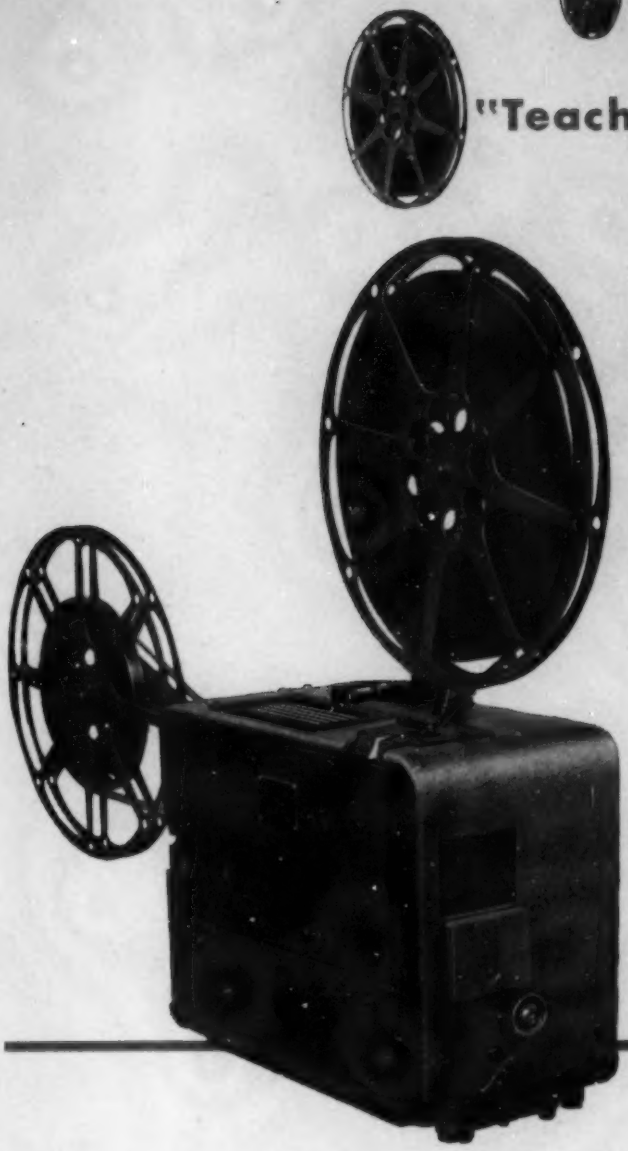

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Puts them to work for you,
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Day after day, more and more educational films are being added to the nation's 16mm film libraries . . . films covering everything from laboratory sciences to fine arts . . . for all classes from the grades through college.

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Since 1907 the Largest Manufacturer of Professional Motion Picture Equipment for Hollywood and the World

More *Sloan Flush Valves* are sold *than all other makes combined*

THESE 7 FACTS EXPLAIN WHY...

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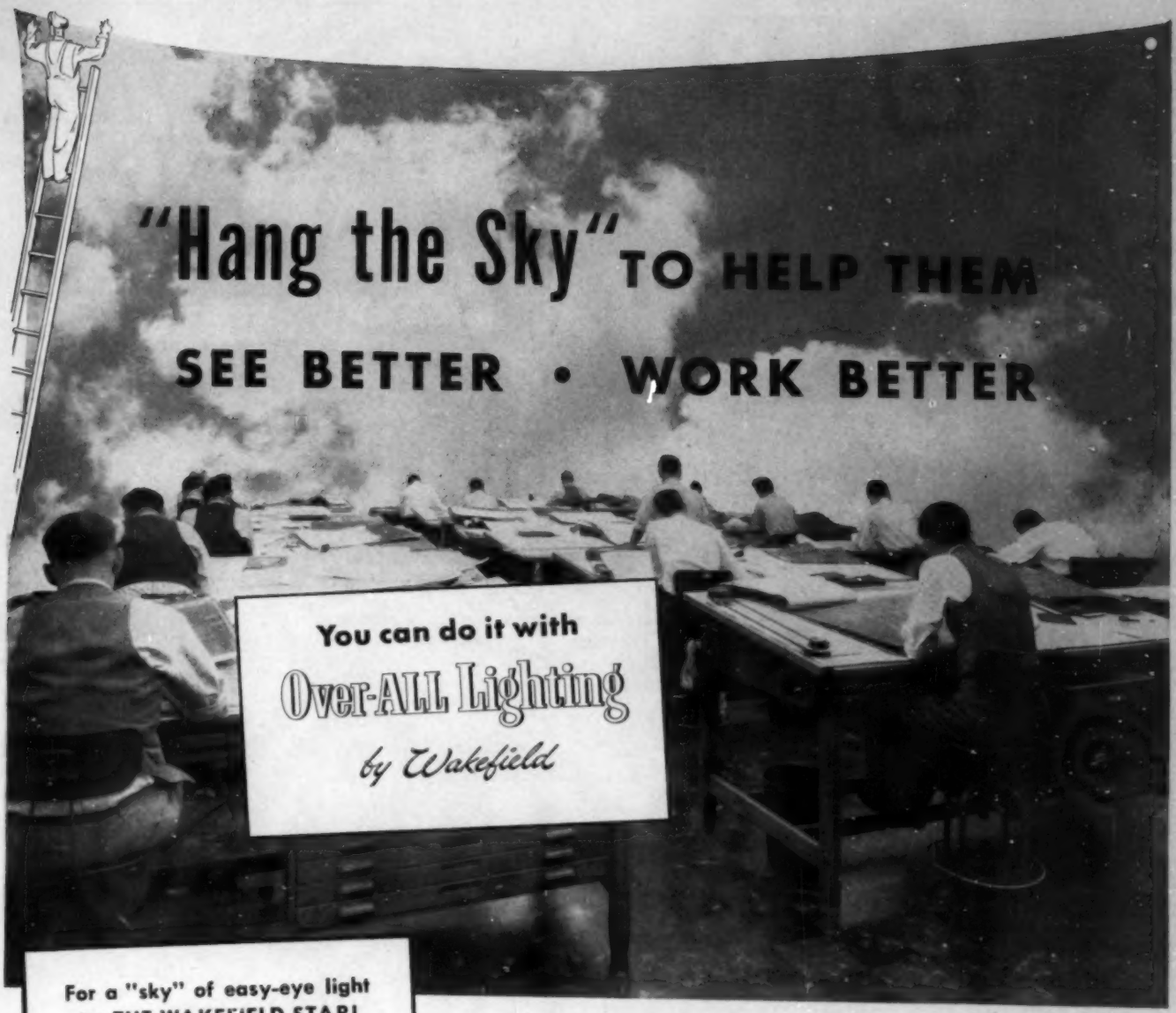

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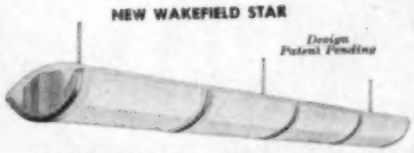

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in sturdy construction
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Lighting like that from Nature's sky — diffused, comfortable, evenly distributed . . . Wakefield Over-ALL Lighting! It's pleasing to students and better for their work. It helps reduce eyestrain and increase attentiveness . . . makes learning and teaching easier.

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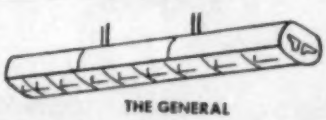

THE GENERAL

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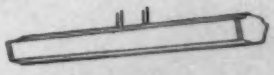
THE COMMODORE



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● Locker security . . . yours at low cost . . . with these fine combination locks by the National Lock Company. Case is of double steel construction. The No. 68-264 masterkeyed lock has a stainless steel outer case. Dial finished in black enamel with numerals and gradations in white enamel for easy visibility. Shackles are 5/16 inch steel.

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Precision Projectors of professional quality

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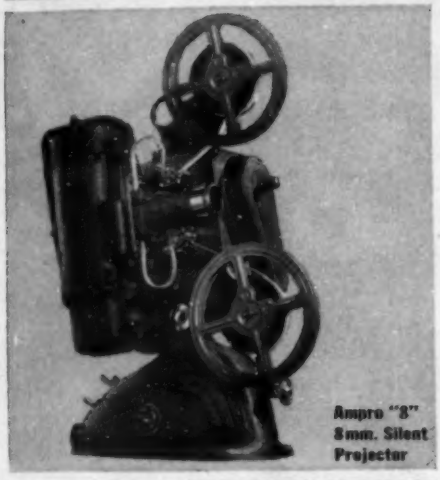

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Ampro projectors are distributed through better photographic and department stores. Write for the name of your nearest Ampro dealer—and for full details on the Ampro Projectors in which you are interested.

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PRECISION CINE EQUIPMENT

Ampresound Model "AA" 16mm. High Intensity ARC Projector

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★SUPER TOUGH
★NON-SKID ★ECONOMICAL

YEARS ON FAMOUS MADISON SQUARE GARDEN FLOOR

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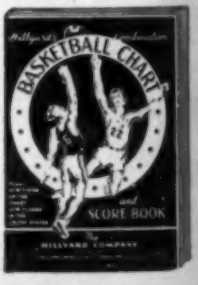
★There is a Hillyard Floor Treatment Maintaineer in your community with answers to any vexing floor problem; his advice on proper floor treatments and maintenance is given without obligation, call or wire us today.



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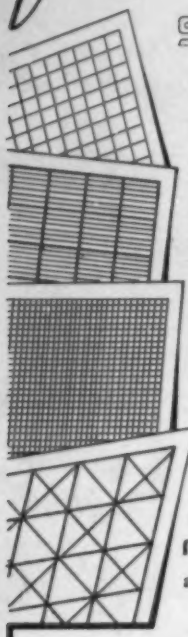

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You can give your school Master-Charted protection without spending a dime of your equipment budget, by using Dudley's special self-financing plan.

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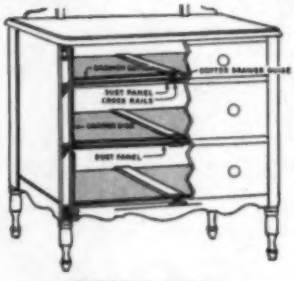
. . . unsurpassed for Basic Harmony

CARROM FURNITURE CRAFTSMEN *Build* FOR THE DECADES



DUST PANEL UNDER EACH DRAWER

Carrom furniture is given every good construction feature that cleanliness as well as hard service requires. As an example, cracks, crannies and crevices are eliminated by close, secure fitting of joints and a panel under each drawer not only helps further to keep out dust and dirt but reinforces the entire construction — adding rigidity.

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Please send me free floor care booklet and catalog:

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Down through the centuries, too, multitudes have hearkened to bells, and to carillons—and this love of bell music has never waned. Why not plan to thrill your community through the years to come with the sweetest bell music ever heard—the music of CARILLONIC BELLS.

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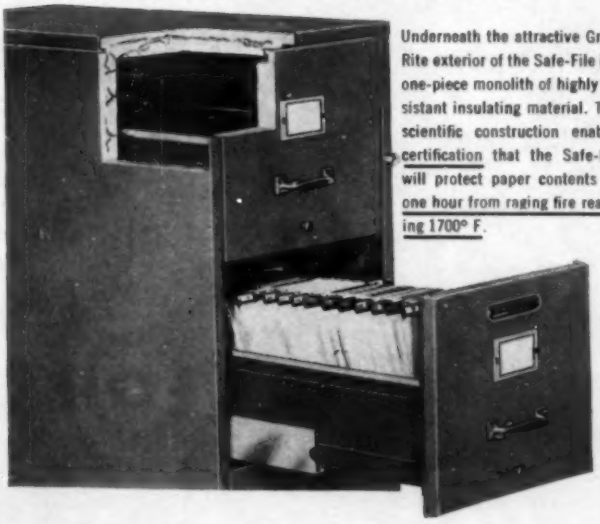
The Insulation that defies fire



Underneath the attractive Gray-Rite exterior of the Safe-File is a one-piece monolith of highly resistant insulating material. This scientific construction enables certification that the Safe-File will protect paper contents for one hour from raging fire reaching 1700° F.

Too often, stories appear in local newspapers covering schools struck by fires which *completely* destroy vital student and administrative records. Think of the difficulty involved in attempting to resume operations in your school after a fire which has wiped out your Student, Financial, Alumni and Faculty records. These records *demand* the protection of *insulated* equipment at point of use twenty-four hours a day.

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THE FIRST NAME IN RECORD PROTECTION

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Hearing Defects Increase Chances of Failure 300%

Research shows that children with impaired hearing are *three times* more likely to repeat grades than those who hear normally.

Good hearing is essential because learning is absorbed mainly through the eye and ear. This is especially true in the lower grades where most of the instruction is oral. Too often the hard of hearing are judged as mentally retarded or behavior cases.

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Precision hearing tests are easy with a modern **ADC** Audiometer because it:

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WRITE FOR BULLETIN G-100

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Checker COAT and HAT RACKS

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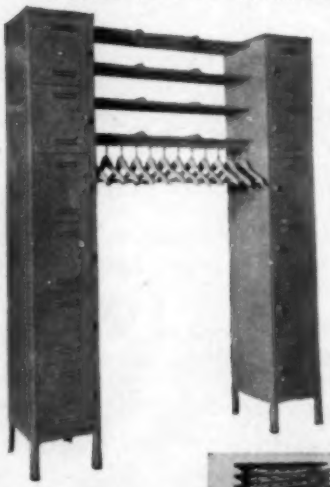

Valet Costumers and Racks keep clothing "in press", aired on spaced hangers, and hats on ventilated shelves. Save floor space—accommodate 3 persons per sq. ft. Fit in anywhere. Lifetime welded construction.

Where lockers are needed for lunches, tools, aprons, etc., use PETERSON Locker Racks. 5 ft. x 15 in. unit provides 12 persons with hangers hat spaces and individual 12 in. x 12 in. x 15 in. lock boxes. These combination units are widely used to double capacity of, or eliminate, locker rooms.

Write for Bulletin H-16

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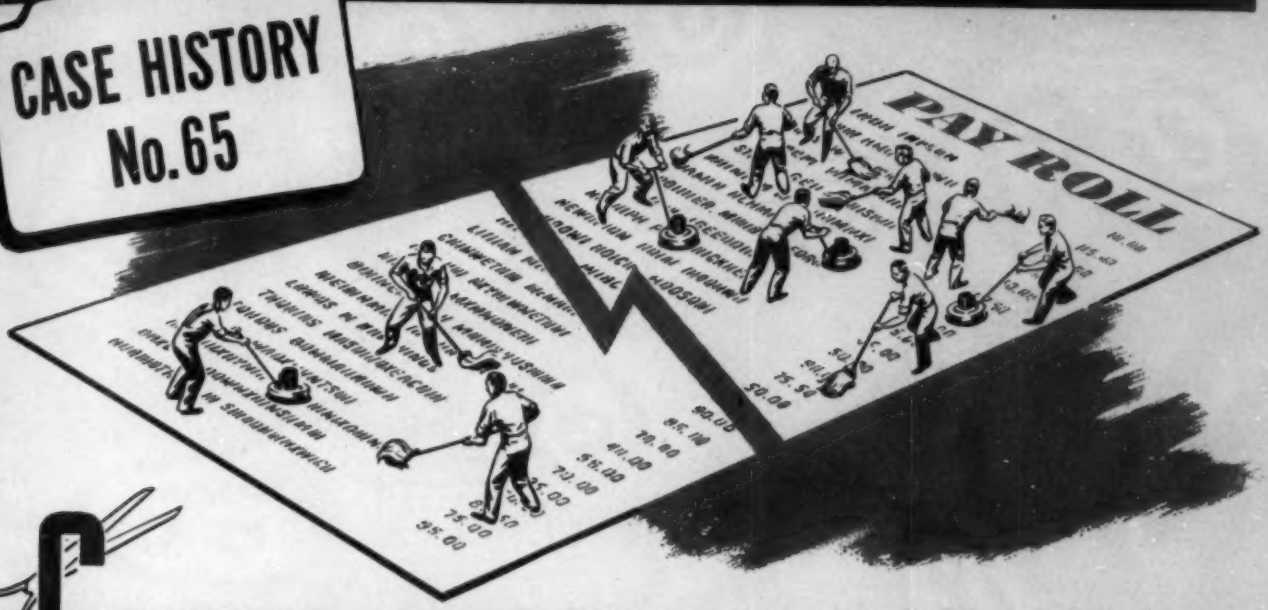
IN A SERIES OF SUCCESS STORIES WITH THE LEGGE SYSTEM OF NON-SLIP FLOOR MAINTENANCE

CASE HISTORY No. 65



CUT FLOOR MAINTENANCE EXPENSE *from 64 man-hours to 6*

EIGHT MEN toiled all night...a total of 64 man-hours...to give a floor of this institution its weekly polishing.

Then the Legge man outlined an economical Non-Slip floor maintenance program. Using the methods and materials he prescribed, three men now polish the same floor in only two hours.

"PERSONAL ENGINEERING" HOLDS COSTS DOWN

Wherever Legge technicians have *engineered* floor maintenance programs... in leading institutions, buildings and plants... accident-free floors at lower cost have resulted. The Legge advisor surveys floor conditions... tailors a workable program to those conditions... follows through with on-the-spot instruction of maintenance crews in money-saving techniques.

This tailor-made plan gives you savings three ways:

CORRECT FLOOR MAINTENANCE COSTS LESS

LEGGE'S 3-WAY PROTECTION

- √ Non-slip Safety
- √ High, Lustrous Finish
- √ Floor Preservation

YOUR 3-WAY SAVINGS

- √ Reduced Insurance Premiums
- √ Maintenance Costs 50% Lower
- √ Floor Replacement Unnecessary

(1) Longer lasting, more permanent finish... takes 25% less materials and half the labor.

(2) Protects and preserves the floor by eliminating harsh treatments and excessive wear.

SAFETY ALONE GIVES YOU BIG SAVINGS

(3) Has slashed floor accidents up to 95% for hundreds of users. Leading casualty insurance companies recommend the lasting anti-slip protection of a Legge program to policyholders to overcome slip hazards. Legge materials are also approved by testing laboratories.

HOW YOU CAN ELIMINATE "HIDDEN COSTS"

Compensation payments... liability claims... inflated insurance premiums... you can cut floor accidents and save these costly "extras" with the Legge System. Our free booklet, "Mr. Higby Learned About Floor Safety the Hard Way," tells how. It's yours without obligation. Just clip the coupon to your letterhead and mail.

LEGGE SYSTEM

OF *Non-slip* FLOOR MAINTENANCE

WALTER G. LEGGE COMPANY INC.

New York • Boston • St. Louis • Chicago • Ft. Worth • Seattle • Cleveland
Los Angeles • Washington, D. C. • Denver • Rochester • Pittsburgh • Detroit

WALTER G. LEGGE CO., INC.
11 West 42nd St., New York 18, N. Y.
360 N. Michigan Ave., Chicago 1, Ill.

Gentlemen:

Please send me your free book, "Mr. Higby Learned About Floor Safety the Hard Way."

Signed_____

Title_____

Type of Floor_____

Area_____ sq. ft. CIS

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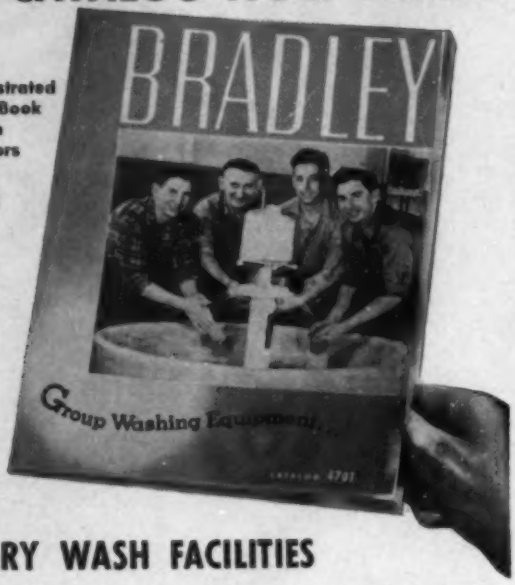
Fully Illustrated 24-Page Book Printed in Four Colors

Catalog No. 4701



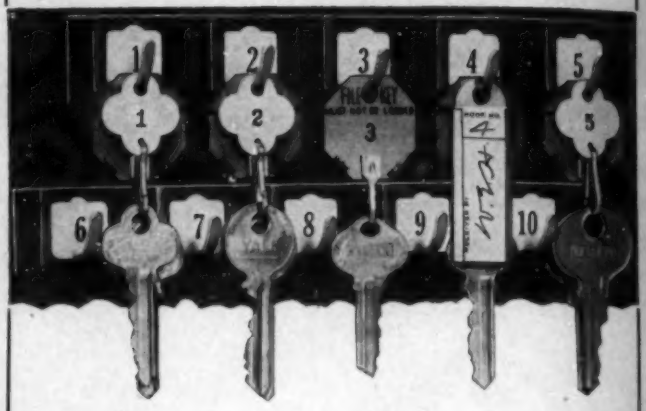
A GUIDE TO SANITARY WASH FACILITIES

This new edition of the Bradley Group Washing Equipment Catalog will prove a handy reference for those interested in improved and more adequate washroom facilities.

If you plan to enlarge present washrooms, add new facilities, modernize, or—construct a new plant—this new interesting book, Catalog 4701, will be of much interest and help. We are more than glad to forward a copy. BRADLEY WASHFOUNTAIN CO., 2353 W. Michigan Street, Milwaukee 1, Wisconsin.

BRADLEY washfountains

NO MORE KEY TROUBLE



1 TelKee is a tried and proven Visible Key-*Filing*—Key-*FINDING* System.

2 Whether there are a few keys or thousands of keys—TelKee is simple and effective.

3 It is the perfect system for knowing your keys—knowing where they are when you want to use them.

TELKEE
Reg. U.S. Pat. Off.

Visible Key Control SYSTEM is the Answer!

Write for Circular.

P. O. MOORE, INC.
298 Fourth Ave.
New York 10, N. Y.

4 TelKee retains a Reserve - Pattern key—never loaned. Tells you to whom other keys have been loaned.

5 Your keys are identified only by the special TelKee Cross Index—Positive Control.

6 New instruction booklet based on 14 years' experience makes it easy to set up and operate.

Beautiful LAWSON SOFA and CHAIR

Made Especially Heavy for School Use

Covered with Koroseal, the colorful waterproof synthetic made by B. F. Goodrich Company that doesn't crack, peel, stiffen or stick.

No. 4H-100K—SOFA, Ht. of back 32½ in., width over all 74 in. Price **$179.95**

No. 4H-400K—CHAIR, Ht. of back 32½ in., width 30 in., seat 23 in. Price **$87.00**

Established 1899

CUB 12-47

Clark Linen & Equipment Co.

303 W. Monroe St., Chicago—3843 N.E. Second Ave., Miami, Fla.

WANT ADVERTISEMENTS

POSITIONS WANTED

Treasurer-Business Manager—Four years as financial and business officer of St. John's College, Annapolis, Maryland; supervising accounting, purchasing, building and grounds, dining hall, dormitories; experience in real estate mortgages, insurance and investment account transactions; knowledge of construction and renovation contracts, government contracts on veteran fees and housing; preparation and follow up of budget; monthly financial statements to finance committee and quarterly report at trustee's meeting; available January, married. Write Box CW 29, COLLEGE AND UNIVERSITY BUSINESS.

Physical Plant Manager—Competent superintendent of buildings, grounds, power plant, utilities, construction, farm and recreational areas; efficient personnel, purchasing, refectory, laundry and business manager; of broad training and extensive experience serving many years with a foremost college. Write Box CW 27, COLLEGE AND UNIVERSITY BUSINESS.

Professional Engineer—With extensive experience in plant operation and maintenance including college and university work is now available; postion of plant superintendent or supervisor of buildings and grounds is desired; excellent references. Write Box CW26, COLLEGE AND UNIVERSITY BUSINESS.

The rates for want advertisements are: 10 cents a word; minimum charge, $2.50.

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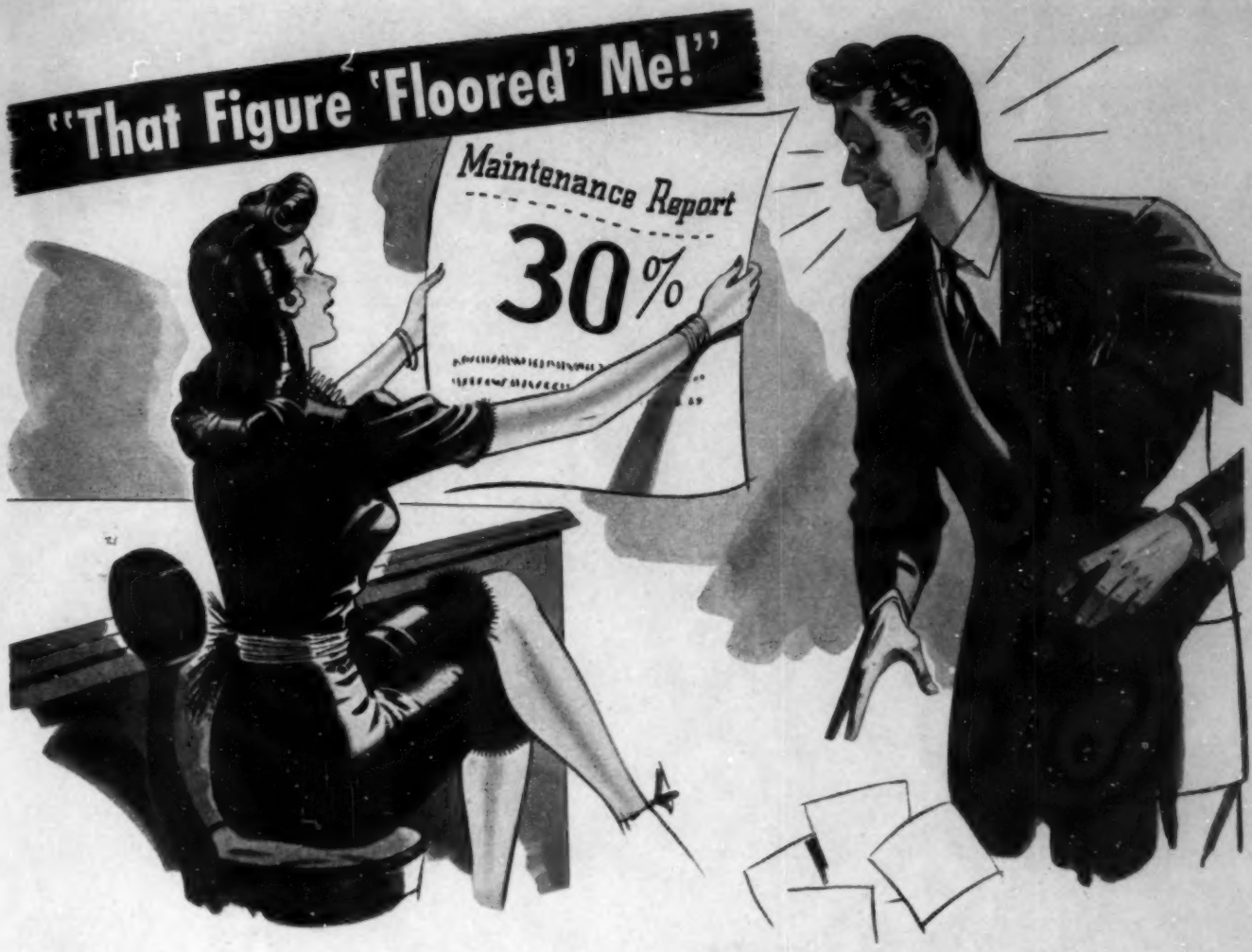


You . . . and hundreds of others! It's easy to see why, too. That figure above (we mean the 30%, of course) represents how much longer your floors can stay clean when you use high quality floor treatments like Car-Na-Lac and Continental "18."

There's a reason for their remarkable performance. Non-slippery Car-Na-Lac and Continental "18" are built to wear longer . . . built to provide an extra hard, non-tacky finish that really resists grinding-in of dust and grime . . . the dirt actually remains on the surface until removed by sweeping. What's more, these outstanding floor treatments are uniquely processed to prevent tracking-off . . . they adhere as though "welded" to the floor . . . literally become part of the floor.

Yes, here is the simple solution to your floor treatment problems. Next time try Car-Na-Lac or Continental "18" . . . both keep floors clean up to 30% longer . . . the figure that has "floored" many!

CONTINENTAL CAR-NA-VAR CORP.
1645 E. National Ave. • Brazil, Indiana
Specialists In Heavy Duty Floor Treatments

CUT THE OVERHEAD UNDERFOOT WITH CAR-NA-VAR FLOOR TREATMENTS

CAR-NA-LAC
LACQUER-LIKE FLOOR FINISH

Acts like a lacquer made of wax. Applied with the usual wax applicator. Levels out as it dries, resulting in a uniform, streakless, lacquer-like gloss. Self-polishing . . . dries in 15 to 20 minutes. Car-Na-Lac floor treatment has at least twice the wearing qualities of ordinary water waxes and is waterproof, non-slippery. Adapted for all floors except unsealed "raw" wood. *Meets Proposed Federal Specifications for Item 9, Type I.*

Both Car-Na-Lac and Continental "18" are approved by the Rubber Manufacturers Association for rubber floors.

CONTINENTAL "18"
THE SUPER FLOOR FINISH

The same as Car-Na-Lac except that it contains about 38% more solids. Heavier solid content gives a higher gloss and reduces number of applications. Covering capacity averages the same as Car-Na-Lac, but one coat does the work of two. Recommended by a leading national casualty insurance company for safety. *Meets U. S. Treasury Specifications for "Finish Material" (and Proposed Federal Specifications for Item 9, Type II).*

IN SCHOOL THEIR HEALTH...
IS YOUR RESPONSIBILITY!

CLEAN HANDS
HELP PREVENT DISEASE

LIQUA-SAN LIQUID SOAP promotes cleanliness in your school . . . helps prevent illness . . . because its quick, penetrating lather removes germs as well as dirt. Better yet, you'll reduce your annual soap bill with Liqua-San "C" for it contains more than 40% pure anhydrous soap solids and is always uniform in quality. Because of its unusually high concentration, it may be diluted with three to four parts water making the cost per wash extremely low. This mild, free-lathering soap is far superior to the average ready-mixed soap in cleansing power and quality. Write for a sample and demonstration.

HUNTINGTON LABORATORIES, INC.
HUNTINGTON, INDIANA • TORONTO

40% SOAP SOLIDS

LIQUA-SAN "C" ®

HUNTINGTON

CONCENTRATED LIQUID TOILET SOAP

Who will fill them?

WHO WILL FILL THE SHOES OF THE valued and trusted employe who leaves your college or university? When you set up a new department or when your institution grows to a point where new department heads or assistants are needed, how will you select exactly the right person for the job? There is probably no more difficult and delicate combination of personal qualifications required anywhere than in building an efficient, smoothly functioning college or university organization. You must have a sufficient number of qualified applicants from whom a genuine choice can be made. No matter how excellent the opportunity you offer, to attract the precisely right person many people must be told about it. Tell them about your opening in a Classified advertisement in COLLEGE AND UNIVERSITY BUSINESS. During these days of personnel migration, it is vital to your institution that adequate personnel be secured immediately to replace employes who have accepted appointments elsewhere or to provide necessary staff for new departments. COLLEGE AND UNIVERSITY BUSINESS is the only magazine in the United States reaching the people who would be most interested in your need or availability. Over *5,000* college business managers, comptrollers, purchasing agents, superintendents of buildings and grounds, residence hall directors, and food service managers receive and read COLLEGE AND UNIVERSITY BUSINESS every month. You can save time by advertising your personnel needs in the classified advertising section of this magazine.

MAKE THESE 3 TESTS WHEN YOU BUY OATMEAL

You'll find Quaker Oats a better buy on all three counts!

1 The choice flakes will stay plump and full-bodied. This is because *all* Quaker Oats are made from fine, firm, plump oats. Only the choice 30% of every bushel is good enough to be Quaker Oats.

2 Here again the plump, choice Quaker Oats flakes give you better texture. They hold in the meat juices. This keeps meat loaves and hamburgers juicier, better flavored, prevents costly meat shrinkage.

3 Folks who know their oatmeal prefer the delicate, nut-like flavor of Quaker Oats and its firm, flaky texture. In a recent nation-wide poll Quaker Oats was voted "best-tasting of all."

Actually, Quaker Oats won more votes than any other cereal, hot or cold!

Make these three easy tests and we believe you will agree that it pays to buy this more delicious oatmeal that stays firm and flaky wherever you use it, and assures you of absolute cleanliness.

THE QUAKER OATS COMPANY • CHICAGO 4, ILLINOIS

WHAT'S NEW

DECEMBER, 1947
Edited by Bessie Covert

TO HELP you get more information quickly on the new products described in this section, we have provided the postage paid card opposite page 40. Just circle the key numbers on the card which correspond with the numbers at the close of each descriptive item in which you are interested. COLLEGE and UNIVERSITY BUSINESS will send your request to the manufacturer. If you wish other product information, just write us and we shall make every effort to supply it.

All-Purpose Vacuum Cleaners

Two new models have been added to the All-Purpose vacuum cleaner line manufactured by Multi-Clean Products Inc. They have powerful one horsepower motors which create a strong vacuum designed to pick up anything small enough to pass through the tubes and attachments. The special attachments include those to clean walls, ceilings, venetian blinds, radiators, overhead beams and other places difficult to manage. A squeegee attachment takes up suds and dirty water.

The motors are sealed against dust, dirt and moisture. Independent air cooling systems for the motors assure longer motor life and increased operating efficiency and safety. Model MCV 214 has a 14 gallon tank and Model MCV 220 has a 20 gallon tank. The new models are portable, non-tipping, easy to operate, safe for wet or dry pickup and are constructed for strength and durability. **Multi-Clean Products Inc., Dept. CUB, 2277 Ford Parkway, St. Paul 1, Minn. (Key No. 634)**

Premium Puddings

Pickwick Premium Pudding is now available in two additional flavors; coconut and coffee. Shreds of top grade Ceylon macaroon type coconut are used to flavor one new pudding and true coffee concentrate the other. This cream pudding, also available in chocolate, vanilla and butterscotch flavors, is packed in 5 pound hermetically sealed cans, six per case. **F. W. Boltz Corp., Dept. CUB, 815 Moraga Drive, Los Angeles 24, Calif. (Key No. 635)**

Koroseal Apron

A new lightweight apron made of Koroseal film has been developed for use where protection from acids, greases, oils, caustics, fats, blood, solvent, soaps and other matters is desired. The clear, transparent film will not become stiff or tacky and can be sterilized in a disinfecting solution. The apron is available in two sizes, 29 by 35 inches with tape and hem and 35 by 45 inches with tape, hem and grommets. **The B. F. Goodrich Co., Dept. CUB, Akron, Ohio. (Key No. 636)**

Toastmaster Waffle Baker

The new Toastmaster double unit waffle baker, Model 2E1, has a Thermoflex Control which automatically adjusts baking time according to the batter used. The waffle baker is snapped on and preheats automatically, ready for

instant use. The adjustment button is set for the desired color in finished waffles and needs no further attention. When the batter is poured in and the cover closed, a pilot light comes on. When the waffle has reached the desired crispness, the light automatically goes off, indicating that the waffle is ready for serving.

The Toastmaster Waffle Baker is modern in design and heavily chromium plated. The grids are of extra heavy, porous cast aluminum, to minimize the possibility of sticking, and the heating elements are practically indestructible. The unit is available in all standard voltages and operates on either AC or DC. **Toastmaster Products Div., McGraw Electric Co., Dept. CUB, Elgin, Ill. (Key No. 637)**

Amcolun Safety Tile

Amcolun Safety Tile combines safety, durability, weight economy and cleanliness. A homogeneous, compact structure, Amcolun is composed of abrasive material and other inert fillers evenly distributed and bonded together. The abrasive used assures long wear in addition to a slip-proof surface. The tiles are resistant to shock impact even though light in weight.

This new tile can be applied over existing wood, concrete or steel floors and is especially adapted for use in showers, dressing rooms, laboratories and other areas where safe footing is required as well as a floor resistant to acids, alkalies, water and oil. The tile is unaffected by weather, thus making it ideal for outdoor use. It is available in red or green, in 6 by 6 or 9 by 9 inch squares, 3/16 inch thick. **American Abrasive Metals Co., Dept. CUB, Irvington, N. J. (Key No. 638)**

Paper Towel Dispenser

Elimination of waste in the use of paper towels is the important feature of the new Mosinee Roltowl Cabinet. The "Rocking Core" feature of the dispenser permits the roll of towels, held by an unbalanced roll holder, to rock only as far as the groove length, causing the towel to tear off at the perforation. Thus it is impossible for the user to spin the roll and secure more towels than are needed. This simple device has no mechanical part to get out of order.

The new Roltowl dispenser also provides a hood to cover practically the whole roll of paper towels except the bottom where the towel is torn off. It is provided with a lock and key so that users cannot disturb the roll, another

protection against waste or loss. **Bay West Paper Co., Dept. CUB, Green Bay, Wis. (Key No. 639)**

Twin Speaker Unit

Greater sound volume and improved tonal quality are the advantages claimed for the new Twin-Speaker Unit now offered as standard equipment with sound Kodascope FS-10-N projectors. The unit consists of two 12 inch speakers built into the halves of a convenient carrying case.

The speakers can be set side by side, placed at an angle to cover the audience, or located at opposite sides of an auditorium stage or platform and connected by an accessory cord. Thus the new unit offers a flexible means of adjusting sound to the arrangement of seats and the size and shape of the auditorium.

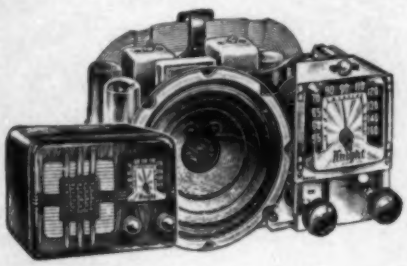
The full volume output of each amplifier is utilized, thus providing greater sound volume when needed. The speakers are designed to handle the power with capacity to spare, thus producing sound which is clear, distinct and undistorted. **Eastman Kodak Co., Dept. CUB, Rochester 4, N. Y. (Key No. 640)**

Ace Hand Trucks

A new line of hand trucks has been developed in which the thrust from the load is carried directly from the nose plate to the frame. Carefully constructed of 16 gauge one inch O.D. furniture grade steel tubing, the trucks are designed for easy handling of crates, boxes and other supplies and equipment. There are 19 different models of varying size and capacity in the line, with either flat or concave crossbars, solid or semi-pneumatic wheels. **The Ace Co., Dept. CUB, 12 N. Orange St., Ocala, Fla. (Key No. 641)**

Radio Builder's Kit

The new Knight Ranger is a low-priced AC-DC superheterodyne radio kit for use in shop or radio training classes. The kit is complete with all parts: hardware, solder, wire, tubes, loop antenna, walnut bakelite cabinet and detailed instructions which make it easy to build. The circuit design is simple to follow while including elements necessary to provide the student with a sound back-



ground of radio theory and practice. **Allied Radio Corp., Dept. CUB, 833 W. Jackson Blvd., Chicago 7. (Key No. 642)**

Frozen Storage Alarm

All colleges with frozen food stored in lockers will be interested in a positive alarm known as the Freezer Sentry which gives warning when temperatures inside the cabinet rise above 12 degrees fahrenheit. The device operates on a simple principle so that there is no mechanical part to get out of order.

When trouble occurs, a buzzer gives the signal which operates on two flashlight batteries connected to the electrical circuit by a trickle charger. Because of the deterioration of frozen food should temperatures rise, the Freezer Sentry is an economical investment. **Jewett Associates, Dept. CUB, 1053 Main St., Buffalo 8, N. Y. (Key No. 643)**

Glass-Enclosed Bulletin Board

The new Beckley-Cardy glass-enclosed bulletin board has a posting panel which slides out from behind a glass front to give full, easy access to the tacking surface. The posting surface is Peerless cork which is designed to seal punctures immediately upon removal of tacks or pins. There are no door frames to obstruct the view, yet the material on the board is protected by the glass enclosure.

The strong wood frame is finished in school brown to match woodwork and

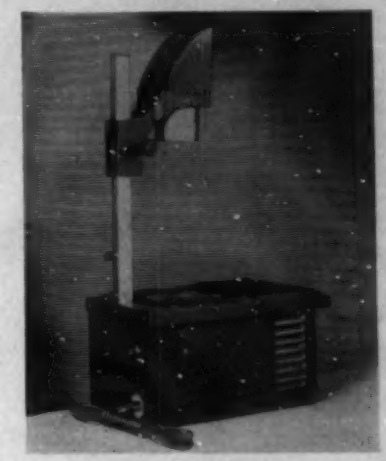
furniture and the board is available in 18 by 24, 24 by 30 and 24 by 36 inch sizes. The wood frame is made to allow the posting panel to slide either to the right or to the left. **Beckley-Cardy Co., Dept. CUB, 1632 Indiana Ave., Chicago 16. (Key No. 645)**

Detecto-Gram Speed Scale

The Detecto-Gram Speed Scale is designed for quick weighing of food portions for meals or of supplies for cooking and baking as well as of supplies received. The short fall, end tower design and simple mechanism make it possible to get accurate results quickly. The oil-controlled dashpot reduces swinging of the indicator to a minimum, thus saving time. The chart is easy to read and the sturdy construction gives the unit promise of long wear. **Detecto Scales Inc., Dept. CUB, 1 Main St., Brooklyn 1, N. Y. (Key No. 644)**

Beseler Vu-Graph

The new Beseler Vu-Graph is an overhead projector by which images are



projected on a screen at the rear of a speaker who can change his own slides or copy, point, underscore, write or draw on the material being projected without turning away from his audience. The device provides a 7 by 7 inch horizontal, fully exposed projection stage upon which any transparent material may be placed and projected. Opaque material can also be used but is projected in silhouette. With the aid of specially prepared films, a speaker can develop problems on the apparatus as the films are being projected.

The machine is so designed that only partial shading of the screen is required and in many cases no darkening of the room is necessary. The special films permit either white on black background reproductions or the reverse and they can be discarded after use, since they are inexpensive, or mounted for ease in projection and for filing.

The Vu-Graph is air-cooled by forced draft, consumes about 550 watts and operates on either AC or DC. Images are centered on the screen by an adjustable mirror and the projector is equipped with a 4 inch diameter precise projection anastigmat objective lens. **Charles Beseler Co., Dept. CUB, 243 E. 23rd St., New York 10. (Key No. 646)**

Hydraulic Pipe Bender

The maintenance department will be interested in the new portable Aujax hydraulic pipe bender which is light in weight and easy to use. Complete with hydraulic jack which has screw extensions for maximum bends, the device is available in two sizes, the 24 inch unit complete with ¾, 1, 1¼ and 1½ inch dies and the 30 inch unit complete with 1½, 2, 2½ and 3 inch dies. All parts are electric welded and reenforced. **Electric Cord Co., Dept. CUB, 30 Church St., New York 7. (Key No. 647)**

Boston Ranger Pencil Sharpener

The Ranger is a new Boston Model pencil sharpener which combines modern design and appearance with rugged

construction. It is equipped with 15 solid steel cutting edge cutters and a point adjuster which permits choice of a semi-blunt, standard or fine point.

The Boston pencil stop on this new model prevents waste of pencils and the pencil guide on the front permits the sharpening of various sizes of pencils. The double bearing engineering feature assures lasting sharpening service. The sharpener can be fastened on a shelf or hung on the wall. **C. Howard Hunt Pen Co., Dept. CUB, Camden, N. J. (Key No. 648)**

Bottle Water Cooler

A new bottle type electric water cooler has been designed for use where plumbing connections are not available or where bottled water is preferred. It is refrigerated by Kelvinator and built by Ebco.

Known as Model K-4-B, the new unit is attractively styled and finished in antique bronze metallic lacquer. It is constructed of heavy gauge, galvanized and bonderized steel and is resistant to rust and corrosion. Holes are provided on the upper right side of the cabinet for mounting any standard paper cup dispenser. The condensing unit compartment is easily reached and maximum ventilation is provided by attractive grilles. The top of the unit is brown vitreous porcelain enamel on steel with a black molded rubber bottle gasket. **The Ebco Mfg. Co., Dept. CUB, Columbus, Ohio. (Key No. 649)**

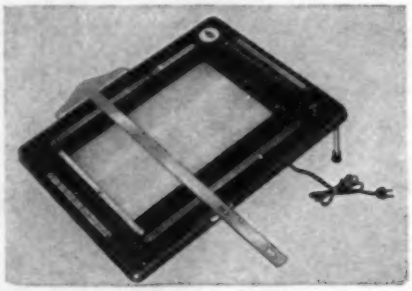
M-1 Projector Table

A new table designed especially for use with visual equipment and known as the M-1 Projector Table stands 42 inches high. It has one shelf 10 inches below the top and a second shelf 6 inches from the floor. The table is 24 inches long and 20 inches wide with top and shelves made of flame proofed, ornamental grain birch plywood finished in Hi-gloss Spar Varnish for acid, detergent and alcohol resistance. The top is edged with heavy chromed metal and each shelf has a 4 inch self rim of treated and finished plywood on three sides.

The 1 inch aluminum tubing frame is acid etched and satin finished. The table is bolted and riveted and has 4 inch ball bearing, full swivel casters with semi-soft rubber wheels. It is strongly constructed and attractive. **Ideal Pictures Corp., Dept. CUB, 28 E. Eighth St., Chicago 5. (Key No. 650)**

Fluorescent Model Technyscope

The new Fluorescent Model F-2 Technyscope for stencil duplication is complete with scope table, T-square and a fluorescent lighting unit. With the new fluorescent lighting unit, which has Underwriters' Laboratories approval, there is no loss of light and the entire writing area of the stencil is amply and evenly illuminated. The lighting unit is entirely enclosed and is so designed



that the scope and the stencil remain cool while in use. A handy light switch is conveniently located on the scope.

The new lighting unit can be purchased separately and attached to other models of the metal Technyscope. It operates on AC 110V 60 cycle. **Technygraph Co., Dept. CUB, 1147 Waukegan Rd., Techny, Ill. (Key No. 651)**

Super Jacketed Kettles

Two construction improvements which enable the Lee Super Jacketed New York Type Tilting Agitator Kettles, Type DYT, to qualify under the requirements of the New York City Department of Health, will be of interest to the college administrator and his food service manager. The redesigned kettle edge is so made as to eliminate the possibility of dirt accumulation and the new flush type plug valve seals the product from the outlet pipe so that no material can remain in the drain uncooked and allowed to sour.

The new Lee Kettle edge is a solid rod of stainless steel welded to the kettle top so that all surfaces are smooth and completely exposed for easy cleaning. The new valve fits exactly flush with the inner surface of the jacket, completely closing off the outlet. The plug is constructed to cut through meat and vegetable cubes and other particles which might interfere with complete closure. It can be easily removed and disassembled for cleaning. **Lee Metal Products Co., Inc., Dept. CUB, Philipsburg, Pa. (Key No. 652)**

Audiometer for Hearing Loss Tests

The new Deluxe Model 50-E Audiometer provides a new speech test through use of a meter-calibrated speech circuit. The new dynamic microphone and meter control the level on speech tests so that actual speech hearing loss measurements are possible. A simplified hearing loss dial provides measurement of hearing loss for both bone and air conduction. Colleges interested in student hearing tests will find many advantages in the new model. **The Audio Development Co., Dept. CUB, 2833 13th Ave. S., Minneapolis 7, Minn. (Key No. 653)**

Classroom Record Player

The Zenith record player, with the Cobra Tone Arm which provides fine reproduction with slight wear on records, is now being made available for classroom use. The unit has heretofore been used only in record store listening booths but because it meets all classroom requirements and has been requested for teaching use, it is now being made available to educational institutions.

The unit is designed to withstand hard usage, to deliver full-tone, high fidelity sound, and to be easily operated. The tone arm is designed to bring out full values in music and speech and therefore should meet the requirements of music and music appreciation classes, speech and language classes and other

educational uses. The player can be easily moved without danger of damage. **Zenith Radio Corp., Dept. CUB, 6001 W. Dickens Ave., Chicago 39, Ill. (Key No. 654)**

Restyled Coffee Urns

The Amcoin All-Glass Interior coffee urns have been redesigned for more attractive appearance and more efficient operation. The glass-lined faucet has been improved to add to the quick dispensing feature of the unit.

New Rigid-Tex exteriors on the Amcoin Boilerettes give a fine appearance to these units which have been enlarged from 14 gallons water capacity to 16 gallons. **Amcoin Corp., Dept. CUB, 1148 Main St., Buffalo 9, N. Y. (Key No. 655)**

Victrola Classroom Phonograph

The new Victrola Classroom Phonograph, Senior Model, has been especially designed for teaching. It offers console-instrument performance in a reproducer of table model proportions as the 12 inch speaker and large amplifier provide outstanding tone quality in compact size.

The attractive, blond hardwood cabinet is designed for pleasing appearance which harmonizes with any decorative plan and does not show scratches and wear. The size is 18½ inches wide, 14 inches high and 20½ inches deep. Three ivory tone control knobs on the right side of the cabinet are mounted flush, instead of projecting, thus reducing the possibility of damage or breakage. Separate bass and treble tone control knobs enable teachers to demonstrate high and low tone registers in musical recordings.

The special RCA Victor lightweight pick-up has the "Silent Sapphire" point soldered into place. This feature provides fine reproduction and long life for records. The powerful amplifier has sufficient volume for auditorium use and hand holes in the cabinet help to give the

instrument portability. **Radio Corporation of America, RCA Victor Div., Dept. CUB, Camden, N. J. (Key No. 656)**

Granular Germicide

Pittcide is the name of an improved granular germicide and disinfectant composed essentially of a stabilized calcium hypochlorite. The new product is soluble in either warm or cold water and is designed to permit the germicidal action of chlorine to be employed surely, safely and easily.

The manufacturer has worked out suggestions for individual applications of the new product for surface cleaning, method of applying, materials for applying and other details with correct solution strength for every application. **Columbia Chemical Div., Pittsburgh Plate Glass Co., Dept. CUB, 632 Duquesne Way, Pittsburgh 22, Pa. (Key No. 657)**

Auxiliary Lamps for Emergency Lighting

When, from any contingency, current fails, immediate light is available where the new Big Beam Auxiliary Lamp is installed. This unit is connected to the lighting circuit by means of an extension cord which in turn is connected to a relay unit, an integral part of the lamp. There is no fumbling in the dark and no delay

in providing light with the Big Beam as the relay unit acts in reverse and automatically switches on a bright, diffused light when a circuit failure occurs.

If a portable light is needed, either in emergency or for maintenance and electrical repair work, the extension cord can be removed from the wall outlet and placed in the space provided in the relay housing compartment located on the rear of the lamp container. The unit then becomes a regular portable electric hand lamp which can be switched on or off at will.

The unit is rustproof, weatherproof and sturdily constructed for long life. Lamp heads can be turned a full 360 degrees in any direction and the lamps are available with single head, Model No. 801, or dual head, No. 802. They project a powerful 2000 foot light beam and can be equipped with floodlight, snap-on lens for diffusing light over a wide area when needed. The 20 gauge steel container is finished in baked enamel, the head is chrome plated and the unit is powered by four standard dry cell batteries. The handle is of polished aluminum. **U-C Lite Mfg. Co., Dept. CUB, 1050 W. Hubbard St., Chicago 22. (Key No. 658)**

Dexter Pencil Sharpener

The newly styled Dexter Pencil Sharpener has razor sharp edges which are provided through deep milling of each

cutter blade. The point adjuster permits settings for fine, medium or blunt points.

The receptacle, centering disc and handle are made of Butyrate and the case and uprights are of rust resistant die-cast zinc alloy finished in two tone gray in a modern design. The new model is easily attached to any horizontal or vertical surface. **Automatic Pencil Sharpener Division, Spengler-Loomis Mfg. Co., Dept. CUB, 58 E. Washington St., Chicago 2. (Key No. 659)**

Concentrated Orange Jelly

Concentrated orange jelly with a distinctive orange flavor and high vitamin C content is now being made available for civilian use. The product was made during the war for use in prisoner of war packages sent by the American Red Cross and is only now being made available in this country. The jelly has the golden color of orange juice and is put up in reusable 12 ounce glass tumblers. **Juice Industries, Inc., Dept. CUB, Dunedin, Fla. (Key No. 660)**

Hyloplate Lite Site Chalkboard

The new Hyloplate Lite Site Chalkboard has a new lighter and brighter color designed to make lighter, brighter classroom interiors. A refreshing, cool green in color, the new chalkboard is light enough to aid in the distribution of classroom light and pleasing and restful to the eye. It is designed to reduce the visual adjustment between the chalkboard and adjacent walls and is the result of Weber Costello color research.

The new board was thoroughly laboratory tested through actual installation and use for several years in specially selected classrooms before being put into production for general use. It is designed to be a part of the over-all plans for proper classroom lighting. **Weber Costello Co., Dept. CUB, Chicago Heights, Ill. (Key No. 661)**

Laboratory Evaporator

The Precision Laboratory Evaporator is designed for rapid evaporation of batch volumes up to 3 liters. Twelve liters of water per hour can be evaporated. The concentrated solution is drawn off through the drain cock at the bottom of the glass body after evaporation and the unit can be modified for continuous feed.

All parts of the Evaporator are constructed of Pyrex glass or 18.8 stainless steel. The glass body is made in one piece and the steam chest will stand pressures up to 150 p.s.i. The unit can be thoroughly cleaned after each operation by flushing the entire system. Since it is self-contained, the entire unit can be mounted on a wall with integral brackets. **Precision Scientific Co., Dept. CUB, 3737 W. Cortland St., Chicago 47. (Key No. 662)**

Nylon Warp Wool Blanket

The advantages of strength, resiliency and abrasion resistance provided by nylon thread are now available in a new institutional blanket. This is the result of several years of research by du Pont and Wamsutta Mills for a blanket which would withstand the rigors of institutional wear and laundering. It is made with nylon warp, a new idea in blanket construction, and combines less possibility for over-all shrinkage with greater wearing qualities and increased tensile strength.

The nylon warp is flame and flashproof—it will melt but not burn. It has high abrasion resistance, thus adding to the wearing qualities of the blanket in use and in laundering, while the finish is soft and resilient. The blanket is made with 75 per cent wool and 25 per cent nylon. It is finished with whip stitching and comes in green, rose and cedar. It should prove especially practical for dormitory and other college housing needs. **Springfield Woolen Mill Company, Dept. CUB, Springfield, Tenn. (Key No. 663)**

Twin Automatic Parking Meter

Automobile parking has become a problem for most colleges and universities. Hence the announcement of the new Alfco twin automatic parking meter will be of interest. The device parks two cars independently of each other with but one meter, one clock, one housing and one coin box. Thus two cars can be parked bumper to bumper, leaving the parking area thus saved for easy entry and exit. The original cost is thus cut as well as the expense of installation, maintenance, winding and collections since one meter does the work of two single ones. **American-LaFrance-Foamite Corp., Dept. CUB, Elmira, N. Y. (Key No. 664)**

Copy-Rite Liquid Duplicator

The new Copy-rite Liquid Duplicator is designed to make copies quickly and easily without the use of stencils, gelatin, ribbons, type or ink. Fingertip controls make the new duplicator simple and easy for even inexperienced operators to use. The master sheet is placed in the drum, automatically locked in place, and when

the drum stops, the master sheet is automatically released for easy removal. A full ream of copy paper can be loaded from the side without removing the automatic paper feed which is perfectly balanced. A safety device prevents damage to this feed if the unit should be turned on without copy paper.

The new model is sturdily built for heavy duty and will handle paper and card stock from post cards to 9 by 14 inch size. The side guides are adjustable but fixed positions are set for conventional sizes of paper and cards. The new unit embodies the principle of roller moistening without wicks or pumps and is practically foolproof, requires little service and is economical to operate. It has an attractive two tone gray finish. **Wolber Duplicator & Supply Co., Dept. CUB, 1202 Cortland St., Chicago 14. (Key No. 665)**

Feather Renovating Machine

The new Huebsch Feather Renovating Machine is designed to sanitize, restore and revitalize pillows that are flat and lumpy. Feathers are emptied into the hopper of the machine where fan suction automatically draws them into a processing bag. They are then treated with live steam and high temperature air which makes them soft and fluffy. Ticks are washed and ironed separately and the feathers replaced in the same manner in which they were originally removed from the tick.

The machine can be easily converted, by lifting out the removable hinge pin and removing the left hand door, to a regular four coil laundry tumbler when not needed for feather renovating. **Huebsch Mfg. Co., Dept. CUB, 3744 N. Booth, Milwaukee 12, Wis. (Key No. 666)**

Liquid Type Duplicator

The new Ditto Model D15 Duplicator is a postwar model, completely new in design and engineering. Employing the Ditto Direct Process principle, there are no stencils to cut, no type to set, no mats to sensitize as the Ditto original is a sheet of paper. A deposit of dye is placed on the sheet by writing, typing or drawing through Ditto Direct Process carbon paper which comes in purple, green and blue. All colors may be applied to the same original and all are reproduced in one simple operation with the new machine.

The new engineering features of the Model D15 include only one turn of the handle for each copy; 100 or more copies per minute; receiving tray which folds up over the machine and serves as a protective cover when not in use; feeding tray and rollers which are reversible to provide greatest efficiency when feeding long and short copies; new improved liquid and pressure controls; larger, sealed-in liquid tank; new wick holder which is easier and faster to remove; easily adjusted feed tray side guides and all parts easily accessible for servicing

and cleaning. **Ditto, Incorporated, Dept. CUB, Harrison at Oakley Blvd., Chicago 12. (Key No. 667)**

Product Literature

• **"Williams Reversible Window Equipment,"** which permits the cleaning of both sides of a window from inside the building, is described and illustrated in a new catalog issued by The Williams Pivot Sash Co., 1827 E. 37th St., Cleveland 14, Ohio. A special section describes their use in educational institutions and lists those now equipped with these windows. Details of operation of the double hung and plank frame types, ease of cleaning, ventilation obtainable, screening, weather stripping, and specifications are some of the subjects covered together with diagrammatic drawings to illustrate the points made. **(Key No. 668)**

• An attractive file folder type of booklet has been prepared by Geo. McArthur & Sons, Baraboo, Wis., to describe and illustrate **"McArthur Gym Towels Serving Schools the Country Over."** A complete plan book for institutional towel departments, the material included illustrates the ease and advantages of setting up a school towel system, five plans to assist in developing a towel system, how to figure towel costs for five years, and contains swatches showing the superior quality turkish towels manufactured by this company. **(Key No. 669)**

• Those who operate duplicators as well as those who teach business education will find the new **operating charts** prepared by A. B. Dick Co., 720 W. Jackson Blvd., Chicago 6, particularly helpful. There are three charts, one for each of the three current models of the Mimeograph brand duplicator. Each chart details, in simple, complete instructions, the operating procedure for each type of machine. The charts are 50 by 38 inches, suitable for hanging in the classroom or office where Mimeograph equipment is used, and can be read from any part of an average classroom. **(Key No. 670)**

• Leaflets covering their line of quality **electrical and mechanical equipment for repair and maintenance** have been issued by Holub Industries, Inc., Sycamore, Ill. The engineering and maintenance department should find this "Hi" material particularly helpful. **(Key No. 671)**

• The complete line of uniforms for men and women made by Shane Uniform Company, Inc., Evansville 7, Ind., is described and illustrated in the attractive **Catalog 447, "Shane DeLuxe Uniforms,"** recently released. All types of uniforms are pictured; food service, maintenance, professional service, general service, technicians and others. Information on Shane quality and controlled production of uniforms is given in detail and the catalog is printed in color with a color selector included for ease in ordering. **(Key No. 672)**

Dishwashing problems are constantly arising in any institution which serves food of any type. Thus the series of posters on this problem which has been prepared by Hobart Mfg. Co., Troy, Ohio, should be of interest to every executive or department head even remotely concerned with this detail. **"Sparkling Silverware"** is the title of the most recent release. Twelve and one half by 18 inches in size, printed on one side only on heavy paper so that it can be hung adjacent to the dishwashing machines, the poster shows every step in the proper washing of silverware for obtaining good results. Regular washing is pictured and each step briefly and clearly explained, alternate methods are suggested, toweling aid, storing, handling, detarnishing practices and burnishing suggestions are all included. Even a chart showing correct table arrangement of silverware is shown. The complete series to date, which includes a poster on the proper handling of tableware and detailed instructions for getting maximum use and value from dishwashing machines, is available on request. The instructions are applicable to any type machine and the series is designed to improve the quality of institutional dishwashing. **(Key No. 673)**

• Complete data and specifications on the Wurlitzer Organ are given in a leaflet issued by the Rudolph Wurlitzer Co., Organ Div., North Tonawanda, N. Y. Entitled **"In Your Plans for Schools, Colleges and Universities Specify With Confidence the Wurlitzer Organ,"** the folder gives details to show why this statement can be made. **(Key No. 674)**

• The increasing use of school and college auditoriums makes the new bulletin on **"Powerstat Theater Dimmers"** issued recently by the Superior Electric Co., 2176 Church St., Bristol, Conn., of particular interest to administrators and those specifically concerned with auditorium management. Bulletin 347 gives detailed information on types of dimmers designed to handle anything from a large auditorium to a small display. The requirements of schools are thoroughly covered and information is given on custom built dimmers for unusual needs. Ratings of all types of dimmers illustrated and described in the bulletin are listed. **(Key No. 675)**

• The saving of time and energy of key personnel in waiting for information, going from office to office for conferences and waiting for calls to clear through the switchboard through the use of the Executone intercommunication systems is discussed in a booklet, **"How to Solve Communication Problems,"** issued by Executone, Inc., 415 Lexington Ave., New York 17. **(Key No. 676)**

• **"The Buying and Care of Sheets and Pillow Cases"** is the title of an informative booklet issued by Cannon Mills, Inc., 70 Worth St., New York 13, designed for teaching purposes or for the information of those responsible for the buying and care of linens for dormitory and other living quarters. With the booklet are included three wall charts, 22 by 34 inches in size, entitled "Sheets and Pillow Cases are of Two Kinds," "How to Buy the Right Size Sheet" and "Buying Guide for Sheets." The material may be had in quantities for teaching purposes. **(Key No. 677)**

Suppliers' Plant News

Johns-Manville Corporation, 22 E. 40th St., New York 16, announces the opening of the first laboratory and pilot plant building of their Research Center group located near Manville, N. J. The project will be devoted to research in building materials, insulations and allied industrial projects. The new J-M Research Center, when completed, will consist of five or six buildings grouped around a quadrangle. The first building, just opened, will be devoted to research and development involving wet processes and will contain 10 miniature factories or pilot plants, each connected with its own laboratory, thus permitting all experimental production to be completed before the product is sent to a J-M factory for mass production. **(Key No. 678)**

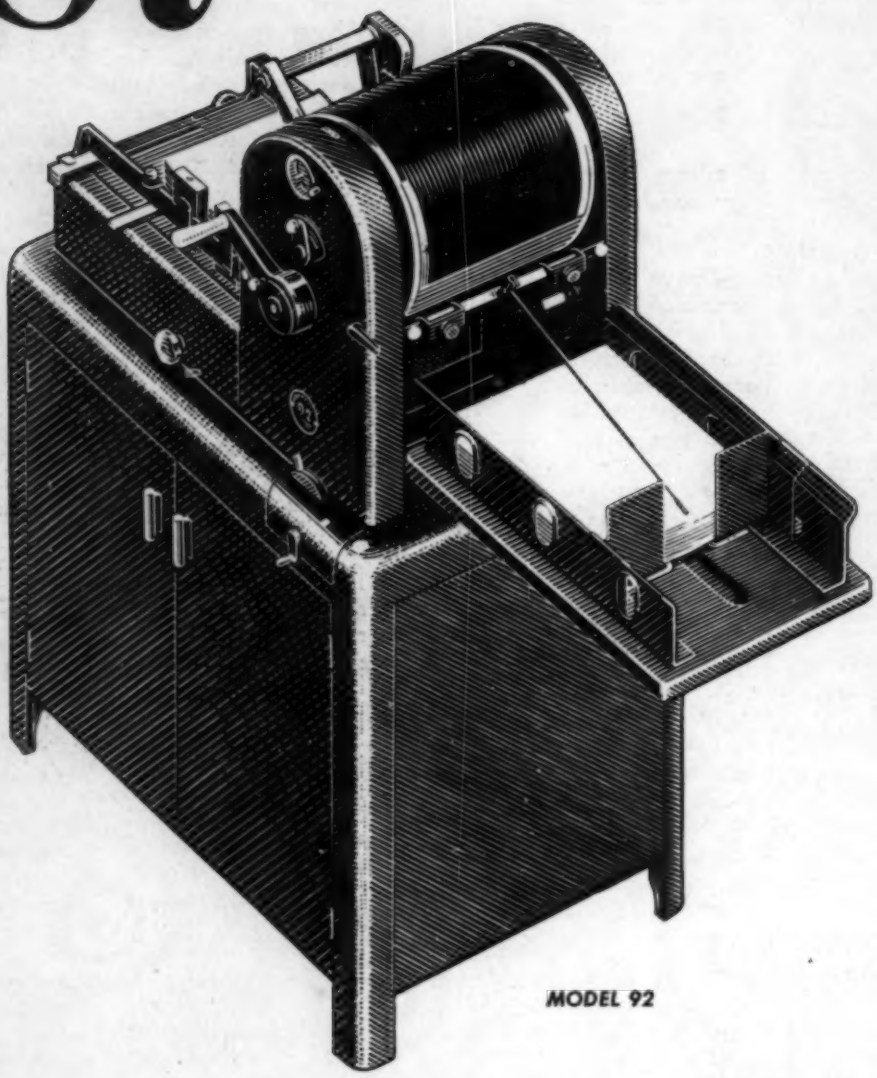
The Maple Flooring Manufacturers Association has recently moved its headquarters and offices from the McCormick Bldg., Chicago, to 46 Washington Blvd., Oshkosh, Wis. **(Key No. 679)**

Sarco Company, Inc., manufacturers of steam specialties, are now located in the Empire State Bldg., New York 1, having moved their main offices from 475 Fifth Ave., New York. **(Key No. 680)**

The Heyer Corporation, manufacturers of duplicators and supplies, has recently moved from 901 W. Jackson Blvd., Chicago, to a new building with expanded production and office facilities at 1850 S. Kostner Ave., Chicago 23. **(Key No. 681)**

The DeVry Corporation, 1111 Armitage Ave., Chicago 14, announces that the **American Film Registry,** 28 E. Jackson Blvd., Chicago 4, has acquired its 16 mm. Film Rental Library. The transfer was made to allow more space for manufacturing facilities at the DeVry plant and so that that company can concentrate its resources exclusively on the manufacture of its line of motion picture products. The American Film Registry will provide the same fine service and high type of classroom films as have always been available from the Film Rental Library. **(Key No. 682)**

fast



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